Equipment for the Amateur Astronomer

Binoculars and telescopes and other astronomy equipment and accessories are the meat and potatoes of amateur astronomy. A good pair of binoculars is what introduced me to the pleasures of stargazing many moons ago and only after a couple of years scanning the skies did I graduate to a telescope. That was one of the department store 60mm telescopes we're all warned about, but my folks didn't know any better, and to a 12-year old kid, it opened up the universe. Telescopes

While cheap (in every sense of the word) telescopes are still to be found, recent years have seen the introduction of small but very affordable telescopes from manufacturers such as Meade and Celestron and, despite their small size, these telescopes have excellent optics that far outperform the cheap optics in my old 60mm scope from so long ago. Many of these small telescopes now come with GOTO features that allow you to select an object to view from an attached handset and the telescope will automatically slew to that feature in the sky. What the ads tend to forget to mention is that in order to use this facility, the telescope must be correctly set up and aligned beforehand. Many scopes, unfortunately, lie gathering dust in corners and wardrobes because their owners couldn't figure out how to use the thing. It's not their fault - better, and simpler, instructions should be supplied with the telescopes. But for those who can work with such an instrument, a wealth of celestial objects are available for viewing that would be quite difficult to find otherwise. Some old hands in astronomy societies have welcomed the new technology openly, others have decried its introduction as it stops newcomers from learning their way around the skies using a technique called star hopping. In some ways, they see that there must be a little pain in finding an object before you can have the pleasure of viewing it. I suppose it's a bit like the difference between being bussed to Machu Pichu or going on a five-hour hike up the mountain to see it. Which would you choose? If the hike is your cup-of-tea, then star-hopping is for you. Personally, I think the introduction of GOTO mounts has been a very positive development and has made the hidden beauty of the night sky accessible to many more people. If you've bought a small telescope with an integrated GOTO mount yourself, but are unsure of how to use it or the best objects to view, go along to your local astronomy society or club and ask their help. They'll be only too willing to lend a helping hand. On the other hand, if you do want to develop a knowledge of the night sky, then a simple Dobsonian telescope is a good place to start. These 6-inch and larger reflecting telescopes come on simple mounts that allow you to pivot the telescope left and right and up and down so you can easily point it anywhere in the sky. The Choosing a Telescope article by fellow amateur astronomer Kevin Berwick discusses the different types of telescope that are available and provides sage advice on what might best suits your needs.You'll find a great range of telescopes here. Eyepieces

You should have a selection of eyepieces to use with your telescope to allow close-up views or wide-field views. Planets require small diameter eyepieces to see surface detail whereas larger subjects, like the Pleiades and other large star clusters require wide-field views. Pretty much any eyepiece can be used to get a good view of the Moon or close-up views of it. Eyepieces range from about 3mm to 40mm (i.e. the glass in them, not the diameter of the eyepiece itself!) and come in three fittings: 0.965", 1.25" and 2" (for high-end telescopes). The 0.965" fitting is seldom used these days but older telescopes used eyepieces of this size. There are also different types of eyepiece: Plossl, Erfle, Kellner, Orthoscopic, wide-angle, etc. The magnification an eyepiece provides depends on the focal length of your telescope - divide the telescope focal length by the eyepiece size to get the magnification. A typical refractor (uses lenses rather than a mirror) has a focal length of about 900mm. A 26mm eyepiece would provide a magnification of 34x with this scope. Used with a telescope with a 2000mm focal length, the magnification is 77x. There's another feature of eyepieces called the Field of View. Basically, this is how big an area of sky is seen through the eyepiece. The bigger the field of view, the more can be seen. How much of the sky is seen depends on the eyepiece diameter and the focal length of the telescope. Wide-angle eyepieces (82 degrees field of view, for example) tend to be quite expensive. Average eyepieces, such as Plossls, have about a 50 degree field of view. Wide-angle eyepieces can almost give the sense of â€œbeing out thereâ€•.

Many types of eyepieces are available here. Binoculars

While this discussion has centered mostly on telescopes, binoculars have a role to play in astronomy as well. A quality pair of binoculars costs less than a telescope and is a good entry point for someone familiarising themselves with the sky. They don't offer the same magnifications as a telescope (but magnification isn't everything) but they do show a much wider field of view which makes it easier to navigate across the sky. Because of this wider field of view, you also get to see the 'big' picture. And, because you're using both eyes, there's less eyestrain. You can get binocular viewers for telescopes and those who use them (even though they cost a few hundred dollars and you need two of every eyepiece) swear by them (rather than at them!). A typical set of binoculars will be 10x50s (front lenses 50mm across, with a x10 magnification). More powerful models are available - 20x60s are available from $150 upwards and you can get 20x80s for as little as $215. These binoculars are quite heavy and you can tire easily pointing them skyward for any length of time. Also, because of their higher magnification, any shake in your hands will also be magnified and stars will dart around in the view. For long-duration viewing, you'd be advised to get a tripod and a binocular tripod adapter which lets you securely mount the binoculars on it. Binoculars are also great for looking at large scale celestial objects such as comets. Looking at the Moon through 20x binoculars brings it close enough to see topography but also, you'll see it in three dimensions, something lacking when looking through the eyepiece at a telescope. You can whip out a pair of binoculars much more quickly than setting up a telescope so if you have very changeable weather where you live, they might be a better option for sky viewing. Of course, you can throw a pair of binoculars into your luggage very easily and view the sky from your holiday destination with ease.

Seraching for quality astronomy binoculars?

About the Author

Gary Nugent has been involved with astronomy as a hobby, either running astronomy clubs, publishing magazines or writing astronomy software for over 20 years. He runs one of the best-known astronomy and space news websites - the Night Sky Observer which has been online since 1997.

He is also the creator of the LunarPhase Pro and Jupsat Pro astronomy software packages.

Source: http://www.nightskyobserver.com