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TELESCOPES FOR XMAS

Ken Tapping, 2nd December, 2014

Once again many of us are faced with what to get for the family astronomer for Christmas. If he or she is experienced then appropriate helpful hints would have been dropped around the home for some time. However, if the family astronomer is a beginner some suggestions and advice might help.

That first telescope should be a good pair of binoculars. These are easy to use, and the combination of low magnification and large light-gathering power make for excellent views of the Milky Way, star clusters and comets, the moons of Jupiter and for the larger features on the Moon.

These devices consist of two telescopes fastened side by side, so they are looking in exactly the same direction. In order to make those telescopes shorter and more manageable, prisms are used to fold the light path back on itself and then back again to its original direction. Large lenses, called "objectives" collect the light and focus it to form an image inside the tube. Another lens, called the eyepiece, is then used to view the image. In order to avoid distortions and false colour fringes around the images, the objectives and eyepieces consist of multiple lenses of different types of glass.

Binoculars are described by two numbers, the first is the magnification and the second is the diameter of the objective lens in millimetres. Most objects in the sky are faint, so collecting as much light as possible is a priority. However, bigger objective lenses mean more weight. For the average person, binoculars with an objective diameter of 50mm are a good compromise between light collecting power and weight. These will collect about 50 times as much light as a dark-adapted human eye. Magnification not only makes images larger, it magnifies the effects of any shakiness in your hands, so you don't want too much of it. For astronomy, consider 7x50 or 10x50 binoculars.

However, if the family astronomer has a pair of binoculars, you might consider buying him or her a telescope. This instrument is the workhorse of the

astronomer. The objective may be lens or mirror, and may be large, to collect as much as possible of the light from faint, distant objects. Backyard telescopes with objectives with diameters of 50cm are not unknown, although most amateurs have instruments in the 10-20 cm range. The light may be passed to a wide range of accessories. For viewing by eye, changing eyepieces provides different magnifications. However a camera can be attached, for imaging, or other instruments such as photometers and spectrometers. Since telescopes useful for astronomy are too heavy to hold when observing, a solid mount is a must. It should make the telescope easy to move and point, and then keep it steadily directed where you want to look. There are now "GoTo" telescopes, which have computerized mounts that automatically find what you want to observe. Telescopes and accessory equipment would require a book to discuss properly. There are books that may help, such as Terence Dickinson's "Nightwatch".

Getting the right equipment can lead to a hobby giving a lifetime of pleasure. The wrong choices lead to expensive, bulky, closet dust-gatherers. If you are not an expert on choosing this stuff, deal with people who are. The best place is the local science store, where you can get the advice leading to the right choice. Have a look through the binoculars or telescope first. There should be no false coloured edges on things, and images should be sharp. Binoculars do not require getting used to. If they cannot be adjusted to provide utterly comfortable viewing, don't buy them. If you don't have a science store near you, consult the experts at the local astronomy club. There is nothing like exploring a dark clear sky with a good pair of binoculars or a good telescope. It is well worth the effort to make the right choices.

Jupiter rises around 10 pm. Mars remains low in the sunset glow. The Moon will be Full on the 6th.

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