Through My Eyepiece

By Geoff Gaherty, Toronto Centre (geoff@foxmead.ca)

Essential Accessories

In past columns I've talked about telescopes and eyepieces, the glamourous parts of astronomy hardware. This time I thought I'd talk about some of the less glamourous but essential tools of our trade.

Finder

There are two quite different types of telescope finder. The traditional finder is a small telescope mounted parallel to the main telescope's optical axis. It always has adjustment screws to align its axis with the main telescope. The best of these mounts use two bolts operating against a spring to make alignment easy. The worst have six bolts in two rings requiring simultaneous adjustments of all six.

Any finder with an aperture less than 50 mm is useless. It helps if your finder has approximately the same magnification and field of view as your binoculars. I once made a careful comparison of the many different finders I've acquired over the years, and found that the Antares 8×50 was the best one I owned. I particularly value its long eye relief, which makes getting my eye behind it, while in awkward positions, much easier than with other finders.

Many manufacturers have recently started offering finders containing right-angle prisms. The idea is that these help avoid awkward head angles when viewing through the finder. In practice, I find that these don't work well because there is no intuitive way to get one of these right-angle finders pointing in the right direction.

A better solution is to learn how to use your straight-through finder properly, and to thereby minimize the length of time you have to assume an uncomfortable position. Use your binoculars first to establish your starhop. Then use the "two eye" approach: look through the finder with one eye while keeping the other eye open and looking at the sky beyond. Use the crosshairs, seen in the finder eye, on the sky, to get in the right vicinity, and then switch to the finder telescope for the actual starhop. This requires an ability to superimpose the view through your naked eye with the magnified view through the finder; it can be done with surprisingly little fuss, and is a very useful way to get the telescope pointed at the right starting point.

In recent years, a new type of finder has become popular. It is known by various names, such as "red dot finder" or "unit power finder," or by brand names such as Telrad and QuikFinder. These are "heads up" displays that superimpose a red dot, circle, or other pattern on the sky. You move the telescope until the target overlays the object you're looking for. These are very popular among many observers, but I've never taken to them myself, though I've tried. I have a lot of trouble locating my head back of the finder to pick up the target. The brand names mentioned above are by far the best. The little ones adapted from BB-gun sights are the worst. The red dot is often too bright and the window often coated, making it very hard to see any stars.

Binoculars

Aside from their enormous value as an observing tool, binoculars are also an essential tool for observing with a telescope. Because of their erect images and ease of pointing, they are essential for working out the details of a starhop *before* attempting it with the telescope. It is for this reason, as I've noted above, that it helps if the binocular field of view and magnification match the telescope finder.

I've owned and used many different sizes of binoculars but have found that the 10×50 size is by far the best for general astronomy, and especially so when used in conjunction with a typical 8×50 or 9×50 finder.

Star Atlas

When I started in astronomy 50 years ago, the *Norton Star Atlas* was the standard. It showed wide areas of sky on a reasonable scale. Recent versions have not been as well designed as the older editions because they don't open flat, causing you to lose a strip of stars along the celestial equator. But never mind, a much better atlas has come along recently: *Sky & Telescope's Pocket Sky Atlas* by Roger W. Sinnott (Sky Publishing). This atlas shows the result of careful rethinking by a group of seasoned observers. They seem to have been aware of every atlas problem that has ever bothered me, and in every case they've put it right. The size and scale is perfect, page breaks are well handled, the text is more readable than in any other atlas, and the maps from page to page follow the directions in the real sky instead of following hour angle and going the opposite way. It's simply a delight to use.

For more difficult starhops to faint Herschel objects, I use the *Millennium Atlas*. I do my starhopping with a low-power, wide-angle eyepiece in my 280-mm Newtonian, and I find that the large scale and the 11th-magnitude star designations in the *Millennium Atlas* make excellent guides, better than the 9th-magnitude star limit and smaller scale in *Uranometria*. Since the *Millennium Atlas* is large and heavy, I use slightly reduced photocopies at the eyepiece.

True confession time: Nowadays I find myself not using any of the above tools, as I've become addicted to digital setting circles and GoTo telescopes. After initial alignment (and not even that if the telescope is in Hibernate mode), I just use the hand controller to move between objects. It may be that many of you also skip starhopping entirely, though the penalty is a less comprehensive familiarity with the night sky.

Flashlight

After trying many different flashlights over the years I've settled on Rigel's nice little Skylite. This has both red and white LEDs, and comes on a handy lanyard to hang around your neck. The white LEDs are great for lunar observing and for when you drop that eyepiece holder screw in the grass. When stumbling around the observing field in the dark, I leave the Skylite hanging around my neck, switched to red. This way I can see where I'm going hands free, and I don't bother anyone else, since the light is shining straight down at waist level.

Beware of some cheap imitations that have a hot spot in the light and require a miniature Phillips screwdriver to change the battery.

Observing Chair

An observing chair that enables the observer to be seated comfortably at the eyepiece probably adds a few centimetres to the effective aperture of the telescope. It's so much easier to keep your eye located at the eyepiece's "sweet spot." Currently I use an adjustable desk chair with arm rests and a back because my telescope is permanently mounted in a SkyShed POD. This is the ultimate in comfort! When out on the lawn with other telescopes, I generally alternate between a standard plastic lawn chair and an inexpensive but sturdy folding stool, depending on the eyepiece height. I tried a "Denver chair" but found that it kept dumping me on the ground!

Planetarium software

I've used *Starry Night* since it first came out, and liked it so much that I went to work for the company. There are other fine programs out there, but I've never felt a need to try any of them.

Guidebooks

There's so much to say about these that I'll defer my discussion to the next issue.

Geoff Gaherty recently received the Toronto Centre's Ostrander-Ramsay Award for excellence in writing, specifically for his JRASC *column, Through My Eyepiece. Despite cold in the winter and mosquitoes in the summer, he still manages to pursue a variety of observations, particularly of Jupiter and variable stars. Besides this column, he writes regularly for the* Starry Night Times. *He recently started writing a weekly column on the Space.com Web site.*

A Moment With…

by Phil Mozel,
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Dr. David Charbonneau

"*Home Fusion-Reactor Repair.*" "*Cloning Dinosaurs in Your Spare Time.*" "*Exoplanet Observing For Amateurs.*"

All are book titles we might like to see but are never likely to. Or are we? That last tome is already out there, and amateurs are now contributing to the study of planets orbiting distant suns. This is due in no small part to the work of Dr. David Charbonneau, who demonstrated that almost no matter what your aperture, you too can contribute to the study of far-off worlds.

Dr. Charbonneau was interested in astronomy from a young age, watching the sky from Ottawa as a Boy Scout. Around the age of twelve, he bought a planisphere and used it to find the Andromeda galaxy. He was blown away by being able to spot it with the unaided eye, and this experience, along with the fact that both his parents were scientists, propelled him into his own career.

But why exosolar planets in particular? The discovery of the first such planet was just a few months old when Dr. Charbonneau graduated from the University of Toronto in 1996. At that time, he was considering going into cosmology but while attending Harvard for his graduate studies, he found that a lot of people there were talking about exosolar planets. He decided that searching for planets would be a good idea, because they seemed practical, concrete, and important.

His method of choice is the transit technique: observe a star's brightness and, if it dims periodically, a planet may be moving across its face as seen from Earth. The Venus transit of the Sun in 2004 was a recent local example. It is this technique that is being used

Figure 1 – Dr. David Charbonneau. Image courtesy Julia Cort/NOVA scienceNOW

by the *Kepler Space Telescope* team, of which Dr. Charbonneau is a Participating Scientist, to ferret out planets in the direction of the constellations Cygnus and Lyra. He was an early proponent of using space-based observatories to study the chemical makeup of exoplanet atmospheres. In 2001, he used the *Hubble Space Telescope* for just this purpose and is currently a Principal Investigator for *HST* studies of exoplanets.

Dr. Charbonneau is also a Deputy Principal Investigator for