How to Become a Better Observer

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By Bob Vickers

When my parents bought me that first small reflecting telescope for Christmas nearly fifty years ago, little did I realize it would start me on a lifelong journey to see firsthand as much of the universe we live in as I can. It has turned out to be an ongoing quest not only to see as much as I can but also to see as well as I can. When I first started out, I had little idea of what to look for or even how to look. Like many beginners, my expectations were skewed by beautiful photographs (taken by such places as Lick Observatory) in books and magazines showing every wispy detail of faraway galaxies and frankly, even though I was excited when I "discovered" something new, I can remember being a little disappointed that I couldn't see more. But, gradually, and with practice I came to realize that I could actually see much more than I initially thought I could.

There are quite a few things you can do, both physically and mentally to improve your observing skills. Much has already been said about the physical tricks of the trade and I will only list some of them here briefly:

1. Find a good dark sky site, especially if you intend to look at anything other than the Moon and bright planets.

2. Check the weather forecast and choose appropriate objects to observe for the conditions. If you are trying to split double stars, don't choose a night of poor seeing when star images are not steady. Likewise, don't look for dim faint fuzzies on nights of poor transparency.

3. Allow time for your eyes to adapt completely to the dark before attempting any serious observing -- generally around 30 to 40 minutes.

4. Observe objects as close to the zenith as possible where there is less atmosphere to look through and less light pollution. Choose objects that are away from the direction of light pollution sources.

5. Take care of your eyes – day and night. Use sunglasses that block 100% UV when outdoors in sunlight. Avoid bright sunlight on observing days to allow your eyes to fully acclimate to the dark quicker. Use a red light (preferably with a dimmer) to look at star charts, etc. Red light has the least effect on night vision.

The author at his 12.5" Dobsonian. Photo by Ross Workman

6. Use high quality optics. All other things being equal, a larger aperture shows more detail, but very large scopes can present logistical problems. As is often quoted, the best scope is the one you will use, and ultimately, the size of your telescope is not nearly as important as your skill as an observer. Collimate your scope correctly (if it is of

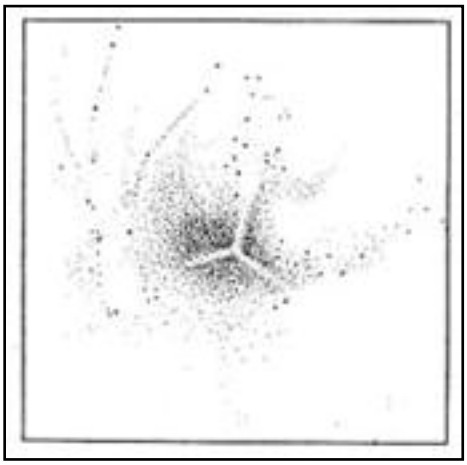
the type that needs collimation) and keep your eyepieces clean.

7. Look through different eyepieces to get different perspectives. Start with a low power eyepiece and increase step by step. Don't be afraid to try higher powers if the conditions allow.

8. Try narrow band filters (for emission and planetary nebulae). These filters help increase the contrast between the object and the background, allowing them to stand out better. Try various color filters for lunar and planetary viewing.

9. When viewing a very dim object, look slightly away from the object (averted vision) so that its light falls onto the most sensitive part of the retina. Experiment to find what works best for you. Also, since our eyes are very sensitive to motion, a slight movement of the telescope will sometimes cause an otherwise invisible object to "pop out."

10. You can't observe carefully if you are too hot or too cold, or if you are in an uncomfortable position, or if you are too tired to keep your eyes open. Dress appropriately and take the time to get comfortable. Get enough sleep the night before or try to get a nap during the day so you are well rested. Take breaks and have a snack so you are not thinking about your stomach more than what you are observing.



As important as these physical elements are, they are only half of the process. They get the image to your optic nerve but the next step is getting the image into your brain. The mental aspects of observing may be even more important than the physical, whether you are attempting to see a nearly invisible nebula or trying to coax as much detail as possible out of that lunar rille.

First, it helps to know what to look for. Read guidebook descriptions and look at reference images. Pay attention to distinguishing features and look for them in the eyepiece. (Be honest with yourself, though. Sometimes we can convince ourselves that we see something when we really don't.) Especially with objects we have viewed before, we tend to see what we are already familiar with and understand, and not see what we have no experience with. Be persistent. If at first you don't succeed, try again another time under different conditions.

Be open to the unexpected. Serendipity is one of the joys of our hobby. During the West Kentucky Amateur Astronomers annual Twin Lakes Star Party in 2007, a group of us were viewing the Tomahawk asterism in Cepheus, also known as Neckerman 2. We all saw the four brightest stars in the group (including the star 15 Cephei) as well as a fifth dimmer star which generated an interesting and animated discussion on color perception in which none of us could agree on the star's color. Later on, one of the members of our group researched the asterism and emailed us that there was a sixth star which, apparently due to our star color discussion, none of us had noticed. I went back to look on the following night only to find a plainly visible nearby companion to 15 Cephei at the SSW end of the asterism -- a very nice little double known as Otto Struve 461 that we had all completely missed due to our star color tunnel vision. So, don't be so intent on chasing that pot of gold at the end of the rainbow that you miss the gold pieces along the way!

Messier Marathons are lots of fun, but you can't make careful observations while speeding through a list of over 100 objects, checking them off as you go. For careful observing, keep it to a handful and spend some time with each one. The longer you watch, the more you will see. Slow down. Don't rush. Be patient. Listen to the sounds of nature around you. Enjoy the dance of the fireflies. Cultivate the ambience and let go of time. You can't take in everything at once. Your brain needs time to process all the nuances of what you see. Also, seeing conditions can change even as you watch and produce moments of clarity that you might otherwise miss.

The only thing better than slowing down is to pause completely and make a sketch (or at least write down the details) of what you see. Sketching, by its nature, forces you to pay closer attention. You don't have to "be an artist" to sketch. Sketches are not meant to be finished works of art but rather an honest attempt to record the essence of what you see for future reference. It is an invaluable aid to improving observing skill.

We can hang out with other more experienced observers and learn from them, but, ultimately, there is no substitute for personal experience. The equation is very simple. More time spent at the eyepiece equals better observing skills. Beginners don't know what to expect or what to look for. They have no past references to which they can compare their observations. There is no magical shortcut to becoming an expert. Like learning to play a musical instrument, we improve only with practice.

That said, if you are experienced, try to avoid the rut of looking at the same old things in the same old way. There is nothing about astronomy that is ordinary. The night sky

is filled with a marvelous variety of objects of different types, brightnesses, sizes, concentrations, distances, colors, and forms. Look afresh at familiar objects. I looked at the globular cluster M13 for years and never noticed its three pronged propeller shaped void until I stumbled across a description of it in a magazine. Now, I can't look at M13 and not see it. Try using a different magnification or orientation than you usually do, or try observing under different weather conditions or Moon phase. Also, get off the beaten path and look at some lesser known objects. There is more to life than the Messiers!

Yogi Berra, one of the greatest (and wittiest) catchers in the history of baseball, once said, "You can observe a lot just by watching." A ridiculously simple statement, yet it is the master key to improving our observing skills. Observing nature is not a passive activity. Rarely do sights of interest fall into our laps requiring no effort or awareness on our part. On the contrary, usually, if we expect to see the dust lanes or star forming regions in that distant faint fuzzy, we must actively look for them. Even those occasional unexpected moments of beauty that serendipitously crop up from time to time require us to take the trouble to be there both physically and mentally.

In his book The Tracker, author Tom Brown tells of learning tracking skills from the Apache grandfather of Rick, a childhood friend. As one of their lessons, they were required to track the old man himself. After following his trail for a while, his tracks just came to a stop and Rick's grandfather appeared out of nowhere behind them. Incredulous, Tom demanded to know how he had disappeared and where he had been. The old man deftly walked backwards in his own tracks and hopped off the trail to stand beside a tree. Tom could not believe that they had missed Rick's grandfather standing next to the trail. "I don't think you look," the old man said.

As amateur astronomers, not only do we need to be in the right place at the right time under the right conditions, we also have to put forth the effort to look. "That," according to Fred Schaaf in his book The Starry Room, "is the ultimate secret to seeing."

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