

## Learn Astronomy

Written by Administrator

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to become an amateur astronomer you don't have to be an expert or know a lot of facts about the universe. You just need to be interested in learning about the universe and know some basic information that will help you to do that

One of the best tools to help in becoming an amateur astronomer is the one you are now using -- your computer. But some things about the universe can be learned more easily by getting out and looking at the sky. That's what we will focus on here.

Many people think that you have to have a telescope to be an astronomer. But the earliest astronomers didn't have telescopes. They studied the movements of the sun, moon, stars, planets, and comets in the sky with their unaided eyes, and noticed that some times of the year had more "shooting stars" than others, that sometimes the planets seemed to move backwards, and many other unexplained things. It took ancient astronomers many thousands of years to figure out how and why the celestial objects move as they do. Our current knowledge is based on their discoveries.

This page is designed to provide information for a wide range of readers who are interested in becoming amateur astronomers -- from children attending middle or high school to adults.

## How to Start Right in Astronomy



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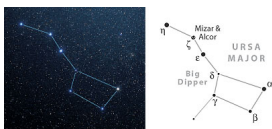
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Did you know you can see a galaxy 2½ million light-years away with your unaided eyes? Craters on the Moon with binoculars? Countless wonders await you any clear night. The first step is simply to look up and ask, "What's that?" When you do, you're taking the first step toward a lifetime of cosmic exploration and enjoyment.

But what, exactly, comes next? Too many newcomers to astronomy get lost in dead ends and quit in frustration. It shouldn't be that way.

What advice would help beginners the most? A while ago, the *Sky & Telescope* editors got together to brainstorm this question. Pooling thoughts from more than 100 years of collective experience answering the phones and mail, we came up with the following pointers to help newcomers past the most common pitfalls and onto the likeliest route to success.

### 1. Learn the sky with the unaided eye.



Astronomy is an outdoor nature hobby. Go out into the night and learn the starry names and patterns overhead. Use the monthly naked-eye star charts. Even if you live in a densely populated, light-polluted area, there's more to see up there than you might imagine.

Even if you go no further, the ability to look up and say, "There's Polaris" or "That's Saturn" will provide pleasure, and perhaps a sense of place in the cosmos, for the rest of your life.

## 2. Ransack your public library.

Astronomy is a learning hobby. Its joys come from intellectual discovery and knowledge of the cryptic night sky. But you have to make these discoveries, and gain this knowledge, by yourself. In other words, you need to become self-taught.



The public library is the beginner's most important astronomical tool. Comb the astronomy shelf for books about the basic knowledge you need to know, and for guidebooks to what you can see out there in the wide universe. Read about those stars and constellations you're finding with the naked eye, and about how the stars change through the night and the seasons. If your library doesn't have enough, cruise your local bookstores . And check the magazine racks.

what you really need right now is a coherent, well-organized framework into which to put the knowledge that you will pick up as you go along. In other words, you need books. Go to the library.

## 3. Thinking telescope? Start with binoculars.

Binoculars make an ideal "first telescope" — for several reasons. They show you a wide field of view, making it easy to find your way around — whereas a higher-power telescope magnifies only a tiny, hard-to-locate bit of sky. Binoculars show a view that's right-side up and straight in front of you, making it easy to see where you're pointing. (An astronomical telescope's view, by contrast, is often upside down, is sometimes mirror-imaged as well, and is usually presented at right angles to the direction you're aiming.) Binoculars are also relatively cheap, widely available, and a breeze to carry and store.

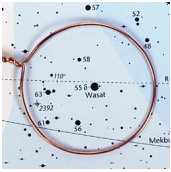


And their performance is surprisingly respectable. Ordinary 7- to 10-power binoculars improve on the naked-eye view about as much as a good amateur telescope improves on the binoculars — for much less than half the price.

For astronomy, the larger the front lenses the better. High optical quality is also important, more so than for binoculars that are used on daytime scenes. Modern image-stabilized binoculars are a tremendous boon for astronomy (though expensive). But *any* binoculars that are already knocking around the back of your closet are enough to launch an amateur-astronomy career.

#### **4. Dive into maps and guidebooks.**

Once you have the binoculars, what do you do with them? You can have fun looking at the Moon and sweeping the star fields of the Milky Way, but that will wear thin pretty fast. However, if you've learned the constellations and obtained detailed sky maps, binoculars can keep you happily busy for years.



They'll reveal dozens of star clusters, galaxies, and nebulae. They'll show the ever-changing positions of Jupiter's moons and the crescent phases of Venus. You can identify dozens of craters, plains, and mountains on the Moon. You can split scores of interesting double stars and follow the fadings and brightenings of numerous variable stars. *If* you know what to look for.

A sailor of the seas needs top-notch charts, and so does a sailor of the skies. Fine maps bring the fascination of hunting out faint secrets in hidden sky realms. Many guidebooks describe what's to be hunted and the nature of the objects you find. Moreover, the skills you'll develop using binoculars to locate these things are exactly the skills you'll need to put a telescope to good use.

Plan indoors what you'll do outdoors. Spread out your charts and guides on a big table, find things that ought to be in range of your equipment, and figure out how you'll get there. Plan your expeditions before heading out into the nightly wilderness.

## 5. Keep an astronomy diary.

This one is optional. But we notice that the people who get the most out of the hobby are often those who keep an observing logbook of what they do and see. Keeping a record concentrates the mind — even if it's just a jotting like "November 7th — out with the 10x50 binocs — clear windy night — NGC 457 in Cassiopeia a faint glow next to two brighter stars." Get a spiral-bound notebook and keep it with the rest of your observing gear. Being able to look back on your early experiences and sightings in years to come gives deeper meaning to your activities now.

For some people, anyway. If this isn't your thing or becomes too much of a chore, never mind.

### **6. Seek out other amateurs.**



Self-education is fine as far as it goes, but there's nothing like sharing an interest with others. Hundreds of astronomy clubs exist worldwide; "star parties." These events, some of which draw hundreds of amateurs, can offer a fine opportunity to try different telescopes, learn what they will and will not do, pick up advice and new skills, and make friends.

Astronomy clubs range from tiny to huge, from moribund to vital, from ingrown to extremely welcoming of newcomers. You'll have to check them out yourself. But none would be publicizing themselves in our directory if they weren't hoping that you would call.

### **7. When it's time for a telescope, plunge in deep.**

Eventually you'll know you're ready. You'll have spent hours poring over the ads and reviews. You'll know the different kinds of telescopes, what you can expect of them, and what you'll do with the one you pick.

This is no time to skimp on quality; shun the flimsy, semi-toy "department store" scopes that may have caught your eye. The telescope you want has two essentials. The first is a solid, steady, smoothly working mount. The second is high-quality, "diffraction-limited" optics.

Naturally you'll also want large aperture (size), but don't lose sight of portability and convenience. Remember, the best telescope for you is the one *you'll use most*. Sometimes gung-ho novices forget this and purchase a huge "white elephant" that is difficult to carry, set up, and take down, so it rarely gets used. How good an astronomer you become depends not on what your instrument is, but on how much you use it.



Many new telescopes have built-in computers and motors that can, in theory, point the scope to any celestial object at the push of a few buttons (after you do some initial setup and alignment). These "Go To" scopes are fun to use and can certainly help you locate sights you might otherwise overlook. But opinions in the amateur-astronomy world are divided about whether "flying on automatic pilot," at least for beginners, keeps you from learning to fly on your own. We think it's important, at least for backup purposes, to be able to use your charts and constellation knowledge to find telescopic objects by yourself — especially if the scope's batteries die after you've driven 50 miles to a dark-sky location!

And as Terence Dickinson and Alan Dyer say in their *Backyard Astronomer's Guide*, "A full appreciation of the universe cannot come without developing the skills to find things in the sky and understanding how the sky works. This knowledge comes only by spending time under the stars with star maps in hand and a curious mind." Without these, "the sky never becomes a friendly place."

It's true that telescopes can cost thousands of dollars, but some good ones can be had for only a few hundred. Can't afford the scope you want? Save up until you can. More time using

binoculars while building a telescope fund will be time you'll never regret.

If you choose to start with a small but high-quality scope, it can serve as your traveling companion for a lifetime — whenever it's impractical to bring along the big, more expensive scope that you eventually buy after your commitment to the hobby has passed the test of time.

### 8. Lose your ego.

Astronomy teaches patience and humility — and you had better be prepared to learn them. Not everything will work the first time. You'll hunt for some wonder in the depths and miss it, and hunt again, and miss it again. This is normal. But eventually, with increasing knowledge, you *will* succeed.

There's nothing you can do about the clouds that move in to block your view, the extreme distance and faintness of the objects of your desire, or the special event that you missed because you got all set up one minute late. The universe will not bend to your wishes; you must take it on its own terms.

Most objects that are within the reach of any telescope, no matter what its size, are *barely* within its reach. So most of the time you'll be hunting for things that appear very dim or very small, or both. You need the attitude that they will not come to you; you must go to them. If flashy visuals are what you're after, go watch TV.

### 9. Relax and have fun.

Part of losing your ego is not getting upset at your telescope because it's less than perfect. Perfection doesn't exist, no matter what you paid. If you find yourself getting wound up over Pluto's invisibility or the aberrations of your eyepiece, take a deep breath and remember why you're doing this. Amateur astronomy should be calming and fun.



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Learn to take pleasure in whatever your instrument can indeed show you. The more you look and examine, the more you will see — and the more you'll become at home in the night sky. Set your own pace, and delight in the beauty and mystery of our amazing universe.