

Finding Our Way Around the Night Sky

Many of us who are new to the night sky have difficulty finding our way around both the night sky with the unaided eye but especially with a telescope. We get so excited after getting our first scope we blow off the essentials in favor of finding anything with our scopes and our disappointment is not far off. We must start by learning how the sky works before we can really understand how to use our astronomy tools.

Everyone knows that the sky appears to rotate as the minutes slide by. It appears the sky is moving but in fact it is we who are moving along with the earth's rotation. As the earth spins on its axis, the sky 'moves' along in front of our eyes. There is an exception however. In the Northern Hemisphere, the star Polaris remains fixed in the same place in the sky, no matter what time of night or day. This is because Polaris is almost directly in line with the North Pole on our earth. This pole is the imaginary line on which the earth rotates (See Figure on apparent motion.)

Some novices find it hard to identify Polaris in our night sky. This is especially difficult around some of our more light polluted areas. Polaris is easy to find if

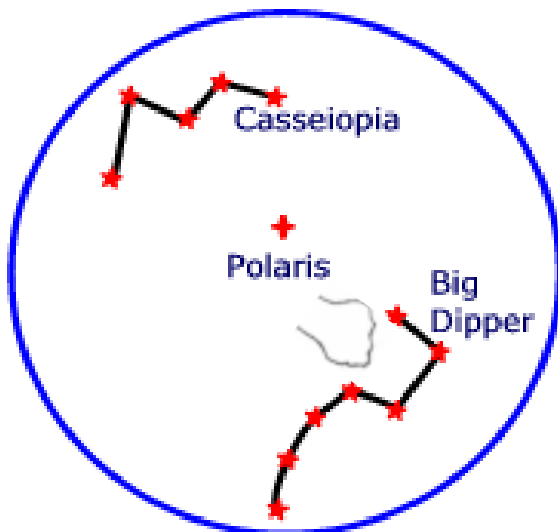
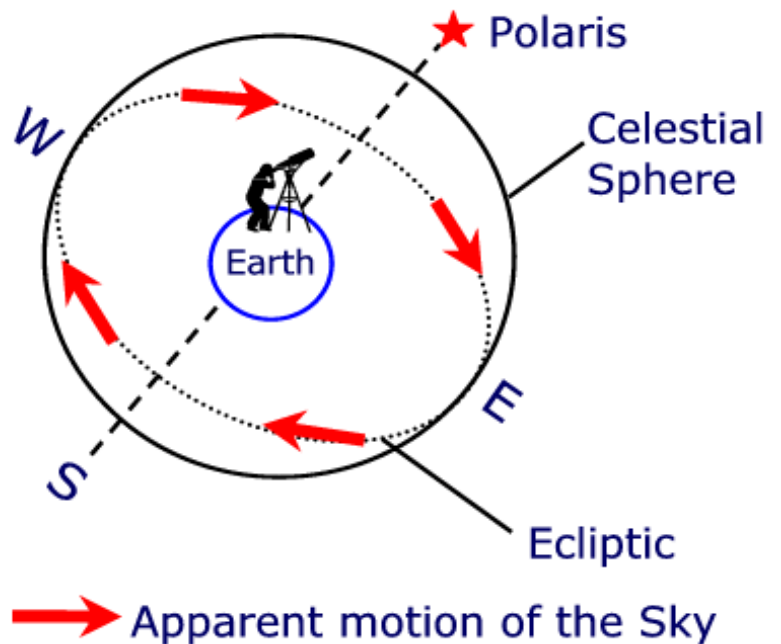


Fig A.
Circumpolar Example

you can identify the Ursa Major, better known as the Big Dipper. Follow the open end of the dipper straight out to the next bright star that is in line with it. This will be Polaris. Each clear night, go out and look for Polaris again and notice that it never moves from its position in the sky. Then take a mental snapshot of some of the stars near it. Look again at the same stars a couple of hours later and notice how they have rotated around Polaris. Since Polaris is always due north, and thus is why it is called the North Star.



There are a few constellations close to Polaris which are always in view from the Chicago-land area, no matter what the season is. One of the easy constellations to find in the sky, Cassiopeia, is nearly always visible. You can find Cassiopeia by looking for a distinct 'W' in the sky. Find the big dipper and follow a line straight through Polaris until the 'W' appears in view. See the Figure A for an example.

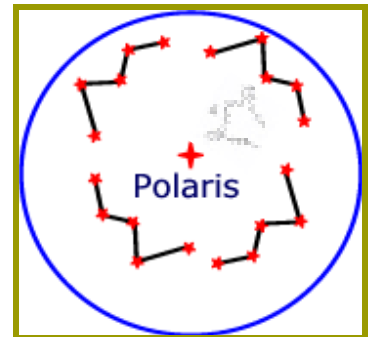


Fig B.
Circumpolar Example

Cassiopeia is one of a few 'Circumpolar' constellations. A Circumpolar constellation means that no matter what time of the year, the constellation can be seen in the night sky. Some star charts will note which constellations are circumpolar. If you were to go out at any time of the night, you would see most, if not all of the mythological daughter of the Queen, Cassiopeia, taking its position in different parts of the sky as depicted by the picture on the right.



Fig C.
25 Degrees

Another difficulty for novices in finding constellations and objects is figuring out how far objects are from certain reference points in the sky. Determining how far objects are from one another is done in degree, minutes, and seconds. For this article, we

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Fig D.
10 Degrees

will deal in the biggest units of degrees. For instance Cassiopeia lies about 30 degrees from Polaris. How can you figure out what thirty degrees is? Well there is a simple rule that is very effective in getting near the right distance between objects. You can do this by extending your arm away from your body towards Polaris. Now hold you hand out like Figure B and have your pinky or thumb touch Polaris. Rotate your hand around Polaris until the 'W' of Cassiopeia comes into view.

To find two objects 10 degrees apart, find the Big Dipper in the sky. The dipper part where the water would be held is 10 degrees wide. Hold out your arm extended again and make a fist. See Fig. D for a visual example of how this works. Your fist should fit inside the bowl as depicted in Figure A on the previous page. Figure E shows the common hand measurements for the night sky.

Using a Good Star Chart

Thus far, we haven't mentioned the single most important way to understand some of the basics; that is having a good star chart at hand. Star charts obviously are meant to help you find stellar objects but using them can be daunting at first. Learning the different charts should be undertaken systematically, starting with the larger features of the sky and working your way down to the smaller ones. For example, it is not very useful to go hunting for the Great Orion nebula if you can't find the constellation of Orion in the sky.

To get an idea of how big a slice of the sky is, consider the moon. The full moon is only a 1/2 degree wide. Hold your pinky finger up to the moon and it should be completely blocked out.

You can obtain a good set of star charts from your local nature store, or from Sky Publishing at <http://www.skypub.com/>.

A good beginner book for astronomy is *Night Watch* by Terence Dickinson. This book contains a lot of simple information about observing and even contains some simple star charts to get you going. I'm sure other club members have great recommendations as well so don't be afraid to ask them.

After obtaining your charts, start by learning the constellations first. You don't even need to go outside to do that. Before I bought my telescope, I spent 2 months memorizing the constellations individually as

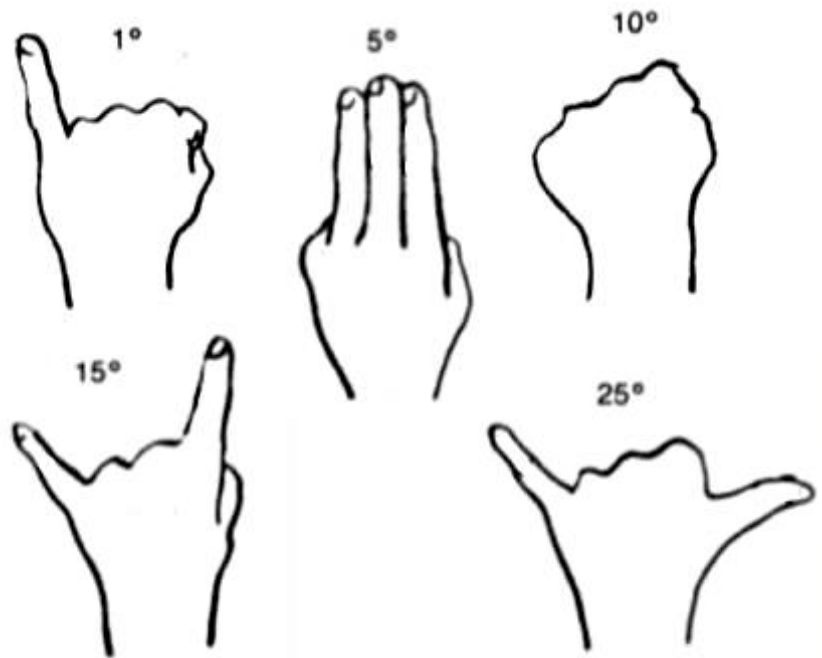


Fig E.
The Common Sky Measurements

well as learning the sequence of them, e.g. what constellation follows what constellation. Every so often, as you are memorizing, take the charts out with you and try to find and make out the details of each mythological figure. I suggest starting with some of the easier ones. The three simplest ones are likely to be the Big Dipper, Leo the Lion, Orion the hunter, the Pleiades and Cassiopeia the Queen. In conjunction with memorizing, mythology helps you to remember the positions sometimes. The constellations, Perseus, Cassiopeia, Andromeda, and Cephus are known from one mythological story. It so happens that they are all close to each other in the sky as well. After you have learned 10 constellations or so, start scanning the some that are nearby each. Keep working your way through the sky based on what you have learned. If you have a pair of binoculars, you can scan your way around each constellation and find some of the easier Messier objects. I suggest that if the Pleiades is up, start with that. It is a very large Open Cluster (we'll go through the type of objects in another issue) and is the easiest Messier object to be found.

Next Month we will describe Messier Objects, why these type of objects are the best known amongst amateur astronomers, and how to find them. We will also talk about some more basic terminology in helping you find your way around the night sky.

- Andy Weeks