

## WHICH WAY IS UP?

(This article by **Bill Warren** appeared in the Sept., 2000 issue of The Observer.)

“Which way is up?”

That’s not quite as dumb a question as it may appear, at least, not when you’re talking about telescopic fields of view.

If you’re a newcomer to astronomy and haven’t read or been told otherwise, you’re likely to assume that, in your telescopic field of view, North is up, South is down, East is to your left and West is to your right.

Is that your final answer?

Wrong. You should have used your telephone call.

First, most telescopes – including *all* Dobsonian reflectors – invert the images they receive, so North will be *down* and South will be *up*. Even then, though, it’s only true when the object lies directly North, South or overhead in relation to the observer. The rest of the time, the only sure indicator of North in your field of view is that *It lies 90° counter-clockwise from West* (or 90° clockwise if you’re using a Schmidt-Cassegrain telescope).

Why is this so? Because the sky as we see it isn’t a flat sheet unrolling from East to West like a scroll, it’s cone-shaped and all of the various celestial objects revolve in small or large circles around the **North Celestial Pole**, which presently lies within 1/2° of the 2<sup>nd</sup>-mag. star Polaris (Alpha UMi). Constellations tilt at different angles as they revolve around the pole.

To tell where North, South, East or West lies in your telescopic field of view, most of the time you’ll need to start by finding West.

The easiest way to find West is to insert a high-power eyepiece in your focuser, center a given star in that field of view, and watch where the star drifts out of view. (The star will move faster in a high-power field of view.) When you go back to low power, West will still be in that direction. It won’t be true two hours later when the star has drifted 30°, but it’ll be true for *now*, while you’re looking for or studying a particular star, galaxy or cluster, etc. Find West, and North and South will be 90° away and East will be 180° in the opposite direction.

West doesn’t change; what changes is the orientation of objects in the sky relative to West as they move across the celestial sphere.

Whenever you're given compass directions in finding an object, then, remember that you need to locate West (or North) to make them work. Remember, too, that every new object you search for in a different part of the sky requires a fresh determination of where West lies in your field of view, or else your finding instructions will be as useless as a politician's promises.

(Incidentally, whenever you use any flat projection of the night sky or any portion of it – say, *Seasonal Star Charts* or *Sky Atlas 2000.0* – the charts are oriented so that North is toward the *top* of the charts and East is to your *left*. Hold the chart upside down to the sky and turn it so that its orientation matches what you see, and the compass directions will be clear. The vertical lines of right ascension will show you where North lies on the chart.

It's not enough to know that West lies somewhere around the end of Mr. Cox's runway: that's true for *you*, but not for the things you find in your telescope.

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