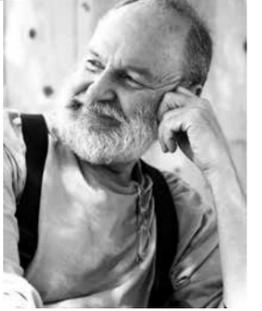


**THE STARRY SIDE**

**Galaxies and stars**

BY GREELEY WELLS



Greeley Wells

As we have improved telescopes like the Hubble, we have looked farther into space and learned a lot more about our universe than ever before. For instance, when we asked the telescope to focus on a blank bit of space—a look at nothing!—it finally revealed tens of thousands of galaxies we had no idea were there. This finding has been followed up repeatedly, and in every direction are more galaxies than we ever knew possible.

These discoveries made a huge shift in our understanding of the size of our universe. All our calculations and assumptions had to be reevaluated and changed, as they did when Einstein and other famous scientists gave us knowledge

and theories that changed our world and shook it up a lot.

At first there was no understanding and very little acceptance; then finally the new theories became undeniable, and everyone got on board. This process took many years. In Einstein's case, the famous photo of an altered star position proved his contention that light was bent because of gravity. The photographer got the defining shot when the moon eclipsed the sun. The photo was an instant success, and Einstein became one of the most well-known and admired humans on the planet.

So maybe kick back some evening and look up at the stars. Think about what the Hubble Space Telescope has shown us,

contemplate those inexhaustible galaxies, and ask what the new discoveries might mean in our world. I know, it stays light so late right now that there's not much up there, but that gradual, late darkness gives you a chance to try a neat game I love to play—"star light, star bright, first star I see tonight"—and make a wish! The first star is also a good luck star. We can always use good luck.

The first star-like object I see is the planet Jupiter in the south. A little later I see Arcturus, sort of mid-sky, a little west. Then, almost overhead, I see Vega in Lyra. Then the rest of the summer triangle slowly shows up, Altar in Aquila and then Deneb in Cygnus. By then the Big Dipper slowly appears with its arching handle going south to Arcturus, and then the North Star and a cascade of stars begin to show up one after another as the sky finally darkens. It's a nice unfolding.

Now that it's dark, here are some highlights for this season:

Last season's trio, Arcturus, Corona Borealis, and Hercules, slide into the western hemisphere, still very visible. Arcturus will be the first to

disappear by the end of October.

By September the summer triangle is still centered in the evening sky. The great square of Pegasus has cleared the eastern horizon, with a bucking horse in half view.

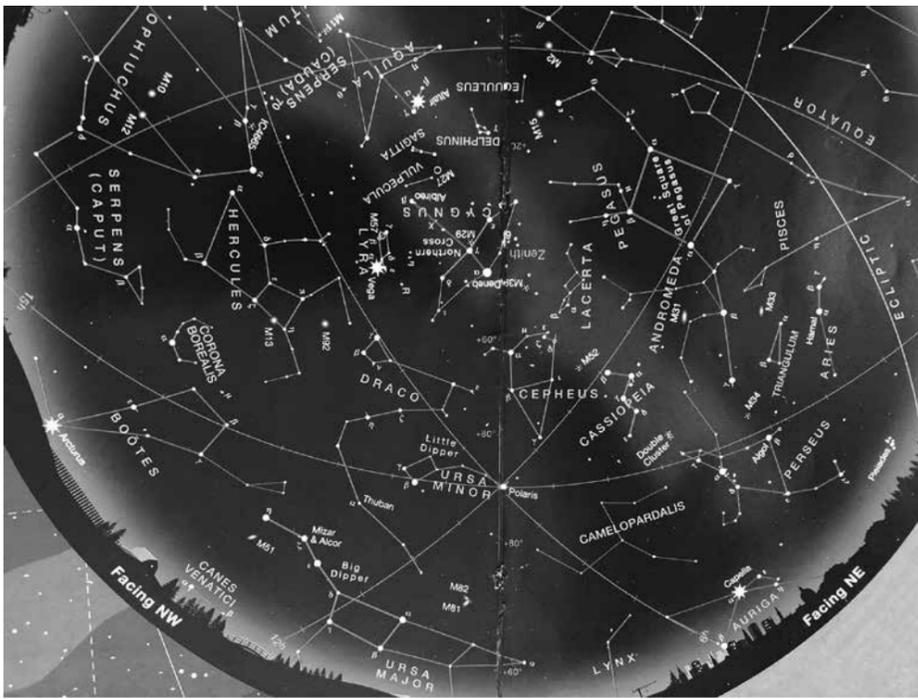
Out of the northernmost corner of the sky comes Andromeda, with two curved widening lines of stars whose point is the corner of Pegasus. The opening at the broad end leads to Cassiopeia.

Cassiopeia's W-on-its-side has come up in the east on the right side of the North Star, rising farther each night. By November it will be almost over the North Star. The Big Dipper of Ursa Major circles lower on the west side of the North Star, heading lower daily. By November it will be directly below Polaris. At my place, it'll be covered by a mountain and out of sight.

At the very end of the Little Dipper's handle is this great North Star, Polaris. By November the Little Dipper will point directly east from Polaris.

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Photo: Sky and Telescope.



**Of Note**

**The moon** will be trying to blot out the meteors this fall, but one meteor shower, Orionids, from the debris of comet Halley, could be visible just before dawn in the light of the waning moon on the night of October 20 - 21.

**Jupiter** is moving to Scorpius (to the right of it and the brighter of the two).

**Saturn**, in Sagittarius, will be in the south, slowly moving west all night and all fall.

**October** will have Mercury and Venus in the dusk sky, Mars in the dawn sky.

**November** will see Mercury and Mars in the dawn and Venus in the dusk.

**September** there will be no Venus, Mercury, or Mars to see. (Sorry!)

Just a reminder: Dawn is early morning before the sun rises, and dusk is the first dark after the sun sets.

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