

THE STARRY SIDE

The real nature of the universe or viva la imperfection!



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BY GREELEY WELLS

The universe is so beautiful and well-ordered. Planets circle around the sun, our moon circles around us, our solar system circles around the galaxy, and the galaxy around the universe, in ordered, predictable ways.

In the beginnings of our science, our illustrators used beautiful perfect circles around each circular orb, but later, with closer observations, we saw that the orbits weren't perfect circles at all. The moon comes closer to us at one point, then moves farther away, in an orbit expanding away from us at a rate of a quarter inch a year. One day the moon will even leave its orbit around Earth! We are regularly closer to and farther from the sun, a pattern that doesn't correspond to warmer or colder seasons because in winter we are actually closer to the sun than in summer. It is the tilt of the earth that gives us our seasons.

What we had thought were perfect circles are oval, elliptical, off-center, and at angles. Whereas once we thought the planets, including ours, were perfectly round, it turns out that almost all of them bulge at the equator.

Although all this is hardly noticeable, we do notice things like the longest day of the year. But, counterintuitively, the longest day doesn't have the earliest sunrises or latest sunsets. The shortest day of the year isn't the coldest, either, nor is the longest day the warmest.

Many such anomalies exist in the universe. Instead of a simple dance of perfection, the universe performs a much more interesting dance of imperfection, which actually *creates* the beauty we know. And part of the beauty is the surprise. For instance, things like eclipses need to be studied carefully to figure out when and

why and how and where they will appear. This depth of "imperfection" adds a level of exquisite beauty and unknowability to what might have been thought of as the simple, boring, repetitious, predictable, perfect dance of the universe. I am so grateful for the anomalies that make our universe so unpredictably fantastic. Viva la imperfection!

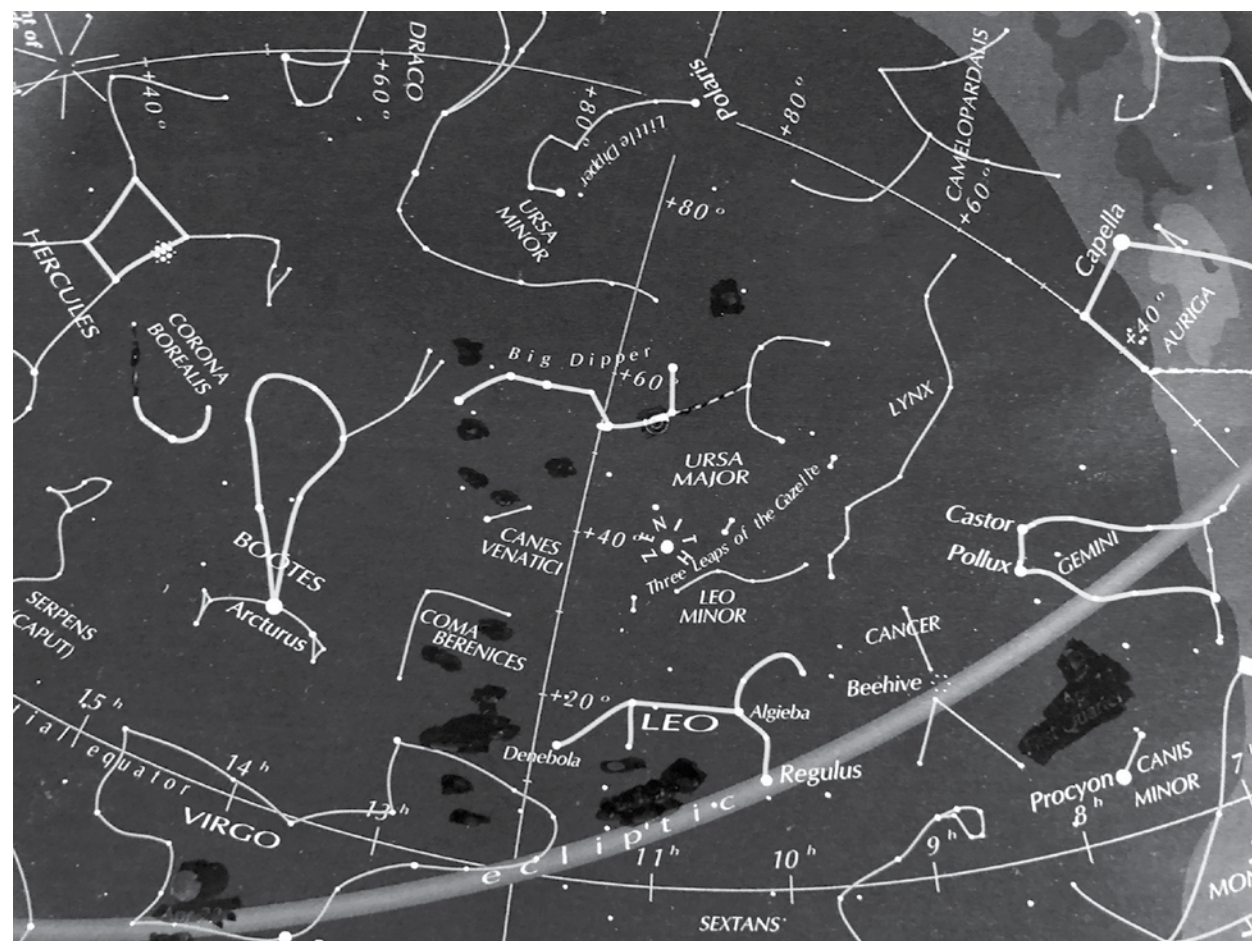
Orion is still setting in the west in April, with the "V" of Taurus setting west-northwest. Sirius is setting west-southwest. Castor and Pollux, in Gemini, are high in the west. Even in May, the Gemini Twins are still there, although all of their other winter cohorts have set. With the Big Dipper going over Polaris (the North Star), Leo the Lion goes almost overhead parallel to it. The zenith (the highest central point in the sky) is between them. These two constellations together make spring's

big and visible constellations. The handle of the Big Dipper has brought into the east one of the brightest stars in the sky: Arcturus (follow Big Dipper's handle arch to Arcturus). Rising in the east is the crown, Corona Borealis, followed by Hercules, the hourglass shape. They are both led by Arcturus up from the east to overhead as this season matures. Vega is rising in the east with Deneb, two of the summer triangle's three stars and harbingers of summer skies. The bright Capella is the five-pointed Auriga, which was overhead last season and now has moved west to soon swing around under the North Star.

Here's to clear, dark night skies and bright stars for us all!

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Hey, check out greeleyandfriends.com—I make movies too!

Illustration from stellarium.org.



Of note

Mars is up in the morning and will begin to brighten dramatically, eventually outshining **Jupiter!** He will reign as the fourth brightest object in Earth's sky—after Venus, the moon, and the sun—from about July 7 to September 7, 2018, this summer. Wow!

Venus has been behind the sun, but in March and April, she is going to sneak into our evening dusk.

The Lyrid meteor showers—April's shooting stars—will last from about April 16 to 25 with about 10 to 15 meteors per hour. The showers will peak in the dark hours before dawn on April 22, when the moon is out of the sky. The Lyrids are known for uncommon surges that can sometimes bring the rate up to 100 per hour! The radiant for this shower is near the bright star Vega, now rising in the east-northeast in the constellation Lyra. It wasn't long ago that Vega set in the west with the very end of summer, but now it appears in the east with spring. The best viewing hours are in the dark morning before dawn.

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