

THE STARRY SIDE

Swinging around the pole star



Greeley Wells

BY GREELEY WELLS

As I look out at the Winter Hexagon from the roof deck I have just built on my Ashland home, I realize that this new view of the sky has pushed me toward new understandings of celestial mechanics, which in turn put me in awe and joy. This roof deck has become a wonderful platform for seeing even more sky than I am used to. Although the Ashland horizon is much lower than my deep-valley view at Carberry (and although Carberry has a much darker and crisper sky, which I love and get much more detail from), the wide open Ashland experience has literally widened my northern views immensely, showing me how everything really is connected to the pole star and swings around it in a most peculiar and marvelous way. Looking out at this celestial dance, I am grateful to J.D. for asking me to write this column years ago, and grateful to all of you who read it and occasionally make comments and ask questions, which trigger me to get out at night more often and learn new things.

The Winter Hexagon (see illustration) is our companion this season: at first prominently overhead and then in the west, it slowly falls into the horizon line as spring approaches, when it sets early in the evening. So we all have another opportunity to figure out the hexagon and enjoy this winter gem. From my new Ashland vantage point, I'm learning more, too. (The Winter Hexagon is an *asterism*, or a pattern formed out of several stars that may be from multiple constellations; the Winter Hexagon is formed of prominent stars from six different constellations. To learn more about the other constellations in the Winter Hexagon, see last season's "The Starry Side" column at our website, where all past issues are available.)

As I write this in December, Vega is rising in the north-northeast under Hercules and Draco early in the winter mornings. That's one of the three stars of the Summer Triangle. Even though Vega is starting to rise now, it won't be until springtime—April—when the Summer Triangle begins to show up. So if you get up early in the morning this winter and look east, you can see the future!

Although some things (such as Vega) are best viewed in early morning hours, the standard viewing time is around 10 pm when most of us are on our way to bed, so that's the time I generally have in mind when I'm talking about what you can see. Remember that before that hour, constellations may not have risen in the east and will have gotten higher in the west. After that hour, the opposite is true: some constellations have risen further in the east and gotten higher, and some have gotten lower and may even have set in the west. Also, as the season progresses, the constellations rise earlier each day, so they are all actually creeping westward each night.

With that in mind, here's what to look for in this new season (February-April). At 10 pm the Big Dipper is rising in the northeast; parallel to it, Leo the lion is also rising. Cancer (the beehive) is dim and hard to see, but it is the next constellation as you look westward (toward overhead). The Gemini twins are high just south of the zenith, the absolute high point of the sky. Southwest of them is Orion. Sirius (the Dog Star) is the brightest star in the sky and is at Orion's heels farther south, forming

the bottom of the Winter Hexagon. Even higher over Orion's head (close to the "top" of the sky) is the bright star Capella in the five-sided Auriga, forming the top of the Winter Hexagon.

As March comes on, this whole scene shifts westward. Arcturus (follow the arch of the Big Dipper to find it) brightly shines in the east in Bootes. Finally, in April Orion begins to stand up straight on the northwestern horizon line, and everyone continues to shift westward in a large arch that dips in the south and ends in the northwest. To the north comes Vega of Lyra fame, reminding us that the Summer Triangle will soon be visible. In April, the Dipper is just north of right overhead; parallel to it is Leo the lion (with Mars below near Regulus, the bright bottom

lower left of the moon on the 24th.

These three monthly "moon moments" are a chance to notice the change in the moon's position each night. You have two relatively fixed points of reference (the planets). Now hold out your fist at arm's length, and you can watch the moon parade by at about a fist's distance each night.

MARS continues to play below Leo during this whole season. In February it moves from west to east, then stops and moves 'backwards' (still under Leo) from east to west. (In Greek the word *planets* means wanderers, and that is what they do. The starry background is quite consistent compared to them.) Mars is heading west toward Regulus in March, and by April is about four degrees from Regulus when

of-February show, but very low on the horizon.

(Uranus is there, too, between Mercury and Venus, but it's even dimmer and you'll need a telescope to see it.) By March's end, Mercury has fallen and disappeared into the sunset glow.

OF SPECIAL NOTE

Moons of this season include the Wolf, Snow or Hunger Moon (February 7), the Lenten, Sap, Crow or Worm Moon (March 8), and the Egg, Grass, Easter or Paschal Moon (April 6, which is also Good Friday). All occur around the same day of the month because there is approximately one full moon per month. (However, since this is not exact, we get a parade of full-moon dates over the long term. And this year, in August, we'll have a Blue Moon, an extra full moon in a single month, just to shake things up!)

Late February is a prime time to look for a very subtle effect in the night sky. From one to two hours after sunset on a moonless night in the western sky, look for Zodiacal Light in the ecliptic—the band the planets, sun and moon move in. It's a pearly white, subtle, almost-triangular light that widens at the horizon. Its meteoric dust lit high in our atmosphere by sunlight coming from well below the horizon high in our atmosphere, which makes it different from "afterglow," which is actual sunlight (not reflected sunlight). So you have to wait till *after* afterglow to see Zodiacal light! Good luck—it's very subtle.

The Lyrid meteors are very favorable on April 21-22, with no moon at all to hide them from view. They can be a strong shower, radiating from between Lyra and Hercules on the northeastern horizon.

Here are some dates to keep in mind this season:

2012 is a leap year, so a leap day, February 29, has been added. Only 97 leap days are added every 400 years. So it's rare!

March 11, early Sunday morning, remember to change the clock forward one hour for daylight savings time. (Although it's been noted that nothing is "saved" so it's really "daylight shifting day"! Then the sun will no longer be highest at noon, but at 1 pm. Personally, I think this whole concept is bogus.)

March 20 is the vernal or spring equinox. March 20 will continue to mark the equinox until 2044, after which it will sometimes shift to the 19th. How this kind of thing works and who figures it all out has always fascinated and confused me.

There's a "dreaded" Friday the 13th in April, so gird up and be brave! There was one in January too and will be another in July. There are usually only one or two a year, so this must be a particularly bad luck year. Actually (I reveal myself again), I think this bad luck stuff is bogus, too!

Finally, April 28 is Astronomy Day, which started in 1973. You may want to explore www.astroleague.org. Another good source of information is Astronomers without Borders, who created Global Astronomy Month in 2010: www.gam-awb.org.

I wish you fascinating nights filled with stars, planets and meteors.

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star in Leo) just south of overhead. Look directly overhead—the zenith—to find four dim stars in a gentle, wavy line from east to west (see illustration) that form Leo Minor. Can you make them out? Are you starting to see why I say that everything around us is swinging in a most peculiar and marvelous way?

THE PLANETS

JUPITER is that incredibly bright star (planet, actually!) that has been up almost all night for months and is now high in the southwest at sunset, heading farther down each evening toward the horizon and toward Venus, who is rising to meet it. In all three of our months this season, Jupiter and the crescent moon provide a magnificent late-month show just after sunset.

From February 23-27, there's a dance: Jupiter drops each night from above, Venus rises each night from below, and a tiny crescent moon way below (see if you can see it on the 23rd) moves up each night until it is above both planets and growing wider by the 27th. So bide your time and watch the weather if you want to see this trio after five late-February sunsets in a row. (To the right of them is the great square of Pegasus, on its side like a diamond.)

From March 24-27, there's another crescent moon dancing, this time with the Pleiades above it adding to the fun. On March 25, the crescent moon is even closer to Jupiter, and Jupiter has moved below Venus, which is close to the Pleiades.

From April 23-25, Jupiter is setting in the sunset, with the Pleiades not far behind, Venus above, and another crescent moon moves through each night. On the 23rd, the moon is above Jupiter and left of the Pleiades. Orion is off to the left of it all, standing upright on the horizon line. Aldebaran is the star immediately to the

it stops again and begins to move east away from Regulus once more. Go figure! Mars then begins a fast fade, becoming dimmer than Arcturus by May 1. This gives us an opportunity to compare a star, Regulus, with a planet, Mars, almost side by side; you'll notice that the planet is steady whereas the star flickers. That is the difference between the "mere" millions of miles between us and our fellow solar system planets, and the light years between us and the stars. Check out Saturn and Spica for the same effect if you're up later in the evening or look later in the season.

SATURN rises each night in the east in the late evening, and on February 8 stops its slow eastward movement and begins slowly moving westward (called "retrograde") toward the dimmer star Spica. In April Saturn is visible all night next to Spica—another star/planet comparison opportunity.

VENUS is bright in the evening sky right after sunset, getting brighter and higher each night, eventually passing Jupiter who's descending (see above). On February 25, the crescent moon is a few degrees right of Venus. A similar dance happens at March's end: on March 26, the crescent moon is near the left of Venus, and the Pleiades are above them both. That's Aldebaran (in Taurus, that "V" shape) to the upper left. The continuing sunset dance with the moon puts Venus at the upper right of the crescent moon on April 24. Early in April Venus runs into the sisters, the Pleiades, and is at its farthest upwards and away from the sun. After this, Venus begins descending. Because Venus and Mercury both orbit very close to the sun, they appear either in our sunsets or sunrises when the skies are dark enough for us to see them.

MERCURY is also in the end-