

# localnews

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LIVING

# Not just a sphere in the sky

## Tracking the moon reveals fascinating pattern linking Earth and sun

Until I began to broaden my interest in nature to include some of the more familiar elements of astronomy, I was only vaguely familiar with the comings and goings of the moon. For me, our closest celestial neighbour was just "somewhere up there." I generally ignored its movements and phases and almost never took time to look at its amazing surface. In recent years, however, I have found that understanding a little more about the moon's phases and its position in the sky in relation to the sun adds a great deal to my appreciation of the changing days, months and seasons.



Drew Monkman

OUR  
CHANGING  
SEASONS

Like the sun, the moon rises in the east and sets in the west. And although it follows roughly the same path through the sky as the sun, it tends to be low in the sky at the times of year when the sun is high and vice versa. That means that during the winter months, the moon rides high above us, while in summer, it stays closer to the horizon. The moon is also different from the sun in that it rises an average of 50 minutes later each day than it did the day before. The moon is also visible during the day as much as during the night. It takes the moon about 29 1/2 days to go through the full cycle of eight distinct phases. Let's take a look at each of these phases in detail. Over the next month, you may want to take a moment to glance up at each of the phases yourself.

**Waning crescent (Feb. 16-20)** The C-shaped "crumbling" moon - a useful memory aid - rises and sets just before the sun and stays in the sky most of the day. However, it is best seen just before sunrise. Sometimes called the "old" moon, a waning crescent moon at dawn seems to glow with peacefulness and connect us to a simpler, less frantic time. It should be at its most beautiful from Feb. 17 to 19. Look for it in the eastern sky.

**New moon (Feb. 21)** On the day of the new moon, the moon rises and sets with the sun and crosses the sky with the sun during the day. The sun shines on the far side of the moon during this phase - the side facing away from Earth - making the moon invisible. The only time we can see it is during a solar eclipse. Each new lunar cycle (lunation) begins with the new moon.

**Waxing crescent (Feb. 22-29)** The waxing crescent moon rises and sets shortly after the sun and can be quite striking in the evening twilight, low in the west. Earthshine (sunlight reflected off the earth, onto the moon and back again) dimly illuminates the moon's surface to the left of the crescent. Looking like the rounded part of a D, the waxing crescent is said to be "Developing" towards the full moon. This phase is poetically described as the moon's "ashen glow" or the "old moon in the new moon's arms." Note, too, that earthshine is most pronounced during April and May. This



You can see the moon in its waxing crescent phase from Feb. 22 to Feb. 29. Note the glow of earthshine and the bright light of planet Venus below and to the right of the moon.

month's waxing crescent phase should be most impressive from Feb. 23 to 26.

**First quarter (March 1)** This is the familiar - but incorrectly named - "half moon." It is called "first quarter" simply because the moon has completed one-quarter of the cycle from one new moon to the next. It is also one quarter of its way around the earth.

Remember, too, that when we are looking at the illuminated part of the first quarter moon, we are just seeing one quarter of the entire surface of the moon and only half the moon's day side. If we could travel to the other side of the moon, we would see an equally bright quarter moon there! A quarter moon rises at noon and is high overhead at sunset. It disappears below the horizon at about midnight and is therefore in the sky about half the day and half the night. This is the best moon phase for looking at the moon's surface through binoculars or a telescope. The shadows cast by the mountains and craters highlight the vast flat plains that the ancients called "maria," (singular: mare) believing them to be seas.

**Waxing gibbous (March 2-7)** The word gibbous means "like a hump." The waxing gibbous moon rises late in the day and appears high in the east at sunset. It is more than half-lighted, but less than full. The waning gibbous shines most of the night and sets before sunrise. It therefore interferes

with star-gazing. It is easy to see a waxing gibbous moon during the day because a large part of the moon's day side is facing in our direction.

Sometimes, the waxing gibbous moon resembles a football. It should be at its most "football-like" on March 3 to 4.

**Full moon (March 8)** The beautiful full moon rises at sunset and sets at sunrise. It always comes about two weeks after the new moon. At this point, the moon is half-way around its orbit of Earth and on the opposite side of our planet than the sun. You can compare the situation to a seesaw. Imagine Earth as the fulcrum of the seesaw, and the moon and sun as kids - albeit one something of a giant - sitting on either end. A lunar eclipse always happens at the full moon, because this is the only phase that Earth's shadow, extending opposite the sun, can fall on the moon's face.

The full moon also appears to be larger at moonrise than when it is riding high in the sky. This isn't because the moon is any closer than usual. It is simply an illusion. When measured or photographed, the moon is exactly the same size, no matter where it is in the sky. Our eyes have much more experience judging the size of objects located straight ahead. We also tend to relate the size

of the rising moon to the hills, trees, and buildings that appear to be close by it. On the other hand, we tend to

see things situated high above us as being smaller.

As for the moon's somewhat orange colour when at the horizon, this is due to a physical effect. When we see the moon low in the sky, we are looking at it through a greater amount of atmosphere than when the moon is overhead. When the moon is near the horizon, its light must pass through a lot more atmosphere than when it is high in the sky. We are actually looking through about three times as much atmosphere when the moon is rising or setting. Air molecules and dust in the atmosphere scatter away the blue, green, and purple components of white moonlight (actually reflected sunlight) and

thereby allow the longer wavelengths of light like orange, yellow, and red to dominate.

**Waning gibbous (March 9 - 14)** The waning gibbous moon rises after sunset and sets after sunset. You often see this phase in the west in the early morning. It can be quite striking as it almost seems to float against the pale morning sky. The waning gibbous starts to take on the shape of a C as it "crumbles" away. It should be at its best from March 11 to 13.

**Last Quarter (March 15)** Half-illuminated - the left-hand side this time - and rising at around midnight, the last quarter moon appears highest in the sky at dawn. It then sets around noon. The

## Great Backyard Bird Count

The Great Backyard Bird Count (GBBC) begins tomorrow, Feb. 17 and continues through Monday. Simply count the birds you see over a 15 minute period - or longer if you wish - in one place, and report your results on line. Go to [www.birdsource.org/gbbc/](http://www.birdsource.org/gbbc/) for all the details. Last year, Peterborough observers submitted 70 checklists which was the third highest in Ontario. Who knows, maybe this year Peterborough could take the number one spot!

## Discover nature on Family Day

The Peterborough County Stewardship Council is holding Discover Nature on Family Day on Feb. 20 at the Brealey Campus of Fleming College. A free lunch is included but pre-registration is required. The Peterborough Field Naturalists are a partner in this event. The full schedule and all the details are available at

<http://www.ontariostewardship.org/councils/peterborough>. You can also email Joe Halloran at [joe.halloran@ontario.ca](mailto:joe.halloran@ontario.ca) or call 705-755-1951.

moon is now three-quarters of the way around in its orbit of Earth, as measured from one new moon to the next. The last quarter moon doesn't interfere with star-gazing until after midnight.

If you are like I used to be and have trouble telling whether or not the moon is waxing or waning - the illuminated portion growing larger or smaller - remember to look for the shape of a "C" (crumbling or waning) or a D (developing or waxing). The following poem that I composed many years ago for my students may also be of help.

Light on right, moon soon bright.  
Night on right, moon soon out of sight.

"Light" refers to the illuminated part of the moon; "bright" refers to the full moon; "night" refers to the dark part of the moon, and "out of sight" is a reference to the new moon never being visible. Go to [www.farmersalmanac.com](http://www.farmersalmanac.com) for an excellent moon phase calendar. And let's hope that the sky is clear in the coming weeks!

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