

Arrival of spring relates to celestial equator

Spring officially arrives for the northern hemisphere at 10:02 p.m. Thursday, March 14, 1991.

The official start of spring often puzzles people. What does exactly determine the precise moment? The answer is the position of the sun with respect to a line called the celestial equator.

The earth's equator is a line that divides our planet into a northern and southern hemisphere. When this equator line is extended out into space it's called the celestial equator, and it divides the sky into two hemispheres as well. Earth orbits the sun, but our planet's axis is tilted 23.5 degrees so the sun may appear as much as 23.5 degrees above or 23.5 degrees below the celestial equator.

In June the sun is at its highest above the equator, because the earth's northern hemisphere is tilted its most toward the sun, and we have summer.

In December the sun is at its lowest point and we have winter.

Obviously there are two points where the sun's pathway crosses the celestial equator. When the sun is traveling from its low point toward its high point, it crosses the celestial equator moving from south to north. The precise moment the sun crosses that line is the official start of spring.

THE POINT of crossing is the vernal equinox. Vernal is the Latin word for spring and equinox means 'equal night.' The length of the day is nearly equal to the length of night during this time. On the vernal equinox the sun rises due east and sets due west. We are rather shortsighted in calling it the vernal equinox. We may be starting spring in the northern hemisphere, but the people below the equator are starting autumn.

Jupiter, Mars and Venus are within 90 degrees of each other on the evening of the 21st. These three planets will continue to get closer to each other during the next three months, and they will form a spectacular grouping on June 23.

The moon, approaching First Quarter phase, is three degrees above Mars on the evening of the 22nd. First Quarter phase is officially at 1:03 a.m. on March 23rd. The moon has completed the first-quarter of its orbit around the earth. On the evening of the 23rd, the moon is in the constellation of Gemini, approaching the twin stars Castor and Pollux. (Castor is above Pollux.) On the following evening, a straight line drawn from Castor through Pollux runs directly into the moon. Jupiter is the bright "star" to the east (left) of the moon.

The moon is near Jupiter all night on the evening of the 24th and will be below and to the left of Jupiter on the evening of the 25th.

The moon is in Leo the lion on March 26, approaching the bright star Regulus (HEG u lus), the "heart" of the lion.

On the next evening the moon has moved below that star. Mercury is at maximum elongation (greatest apparent angle) from the sun on the evening of the 27th. Mercury is 19 degrees east (left) of the sun and very well placed for seeing. This will be the best evening appearance of Mercury for the entire year.

Venus is easy to see, 24 degrees above due west. Mercury is slightly north (right) of due west and 10 degrees above the horizon, 45 minutes after sunset. Observe Mercury with a telescope from night to night and watch as it goes through phases like the moon. Venus and Mars are 45 degrees apart on the evening of the 28th. In three months they will be within one-quarter of a degree (half a full moon diameter) of each other.

FULL MOON occurs at 2:17 a.m. on March 30. The moon will rise in the east; on the evening of the 29th, as the sun sets in the west and be visible all night. The moon is fully lit by the sun, hence the name. Jupiter is stationary on the evening of the 30th. The planet has been drifting westward through the stars of Cancer and, after tonight, will seem to reverse direction and move eastward from night to night. Jupiter doesn't actually change the direction it is moving; the change is an optical illusion that occurs when faster moving planet earth passes Jupiter.

Jupiter is about 3.5 degrees to the west (right) of a star cluster called the bee hive; so named because the stars resemble a swarm of bees when seen through a telescope. To the naked-eye the beehive star cluster looks like a fuzzy patch of light.

County chamber holds mini-expo

The Oakland County Chamber of Commerce invites the business community to attend a MINI-EXPO/MEMBER MIXER 5:30-8 p.m. Wednesday, March 20, at the Kingsley Inn, 1475 Woodward Ave., Bloomfield Hills.

Members will display their products and explain their services to the business community. Complimentary hors d'oeuvres and a cash bar will be available.

There is no charge for Oakland County Chamber members. Cost is \$10 for non-members. For reservations, call 683-4747 or 644-1299.

Look in the east southeast, two hours after sunset, on the evening of the 30th. The moon is back in the constellation of Virgo, approaching the star Spica once again. On the following evening, the 31st, the moon rises 10 degrees directly below Spica.

EASTER is on March 31 this year, but next year it falls in April. Determining the date of this very erratic holiday is not as difficult as you may think. All you need to know is the phase of the moon and a few rules.

The ground rules for determining Easter were set up in the year 325 A.D. when the Emperor Constantine



skywatch
Raymond E. Bullock

called for a Council at Nicea for the purpose of calendar reform.

Based on the advice of his Christian council, he decreed that Easter would be observed on the first Sunday following the first full moon that occurs after the vernal equinox (the start of spring). The reason for

choosing the full moon, rather than the new moon, was so persons making a pilgrimage to the Holy Land could travel at night by the light of the moon.

Since the start of spring occurs on March 20 or 21, the earliest Easter can be is March 22. But now we have

to consider the inevitable exceptions to the rule. If the first full moon to occur after the start of spring falls on a Sunday, then the following Sunday is Easter. If the full moon happens to be on the same day as the vernal equinox, then the April full moon is used. If the April full moon falls on a Sunday, the following Sunday is Easter unless that date is later than April 25, which is the latest date Easter is permitted to fall. If that Sunday does fall after the 25th, then the previous Sunday, the one with the full moon, must be used.

So all things considered, Easter

can come as early as March 22, which it last did in the year 1818 and will again in 2285, or as late as April 25, which it did in 1943 and will again in 2038.

This year Easter Sunday as March 31, which is just one day after the full moon. Now, wasn't that simple?

Raymond Bullock is the former coordinator of the planetarium and observatory of the Cranbrook Institute of Science, Bloomfield Hills. He now works for a Troj company which specializes in laser displays and special effects.

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