ASTRONOMY

Venus Is Christmas Star

A crescent moon and the planet Venus will be close together on December 24, making a brilliant pair that lights the Christmas sky.

By JAMES STOKLEY

➤ This year we will have a real Christmas star. The planet Venus, which has been increasing in prominence during the autumn, will be at its greatest brilliance on Dec. 23.

After the sky gets dark, around this date, Venus will be blazing in the southwest, until it follows the sun below the horizon, more than three hours later. But even this will not be the full extent of the display. On the 24th, the moon, in a crescent phase, three days after the new moon, will pass just to the north of Venus. While the closest approach comes, for Americans, during daylight hours, they will still be close together that evening, Christmas eve, and will form a striking backdrop for the carolers singing their Yuletide greetings.

Venus is the only planet that can be seen well on December evenings. On the seventh, Mercury is farthest east of the sun, and will remain briefly in the southwestern sky after the sun has set. Possibly, if you have a very clear view in that direction, and look closely, you can get a glimpse of this innermost of all the planets, but this is not really a favorable time to see Mercury.

No planets appear on the accompanying maps of the December evening skies, for these show their appearance later in the evening, after Venus has set. They are drawn for about 10:00 p.m., your own kind kind of standard time, on Dec. 1, and an hour earlier at the middle of the month.

In the southeast there is now visible the brilliant array of stars which make the skies of the winter evening so beautiful.

Dog-Star Is Brightest

Brightest of these stars is Sirius, the dog-star, part of Canis Major, the great dog, shown near the horizon. However, its low altitude causes a partial diminution of its light. Later in the night it climbs higher in the southern sky and is then even more conspicuous.

On the astronomer's scale of star brightnesses, Sirius is of magnitude minus 1.4, which means that it exceeds any other star that we can see in the nighttime sky. Compared to Venus, however, it is relatively faint, for the magnitude of that planet is minus 4.4. Venus now is nearly 16 times as bright as Sirius.

Above Sirius, Orion, the warrior, may be seen. In this group are two bright stars of the "first magnitude": Betelgeuse, to the left, and Rigel, a little lower and to the right. Between them is a row of three fainter stars that form Orion's belt.

Directly above Orion is Taurus, the bull, with Aldebaran as the brightest star; distinctly red in hue, it is easy to identify.

To the left of Taurus is Auriga, the charioteer, with the star Capella, another of the first magnitude.

Descending from Capella, we come to Gemini, the twins, with the stars called Castor and Pollux, of which the latter is the brighter. And between Gemini and Canis Major stands Canis Minor, the lesser dog, with Procyon as the brightest star.

Over toward the southwest are found the remnants of the constellations of the autumn evenings. Near the horizon, as shown on the maps, or higher if it is earlier in the evening, is Vega, about all that is seen of Lyra, the lyre. Above and to the left is Cygnus, the swan, with Deneb. While Vega and Deneb both are first magnitude stars, their low altitude makes them look fainter.

About 3:30 a. m., at the beginning of December, and 1:30 a. m., at the end, another planet, Jupiter, appears in the southeast, in Virgo, the virgin. Its brightness now is just about the same as that of Sirius. Mars, of the second magnitude, rises later, about two hours before the sun, in Libra, the scales.

If, on Christmas eve, when the crescent moon is standing nearby, you look at Venus through a telescope, you will find that it also is in a crescent phase.

Crescent Venus

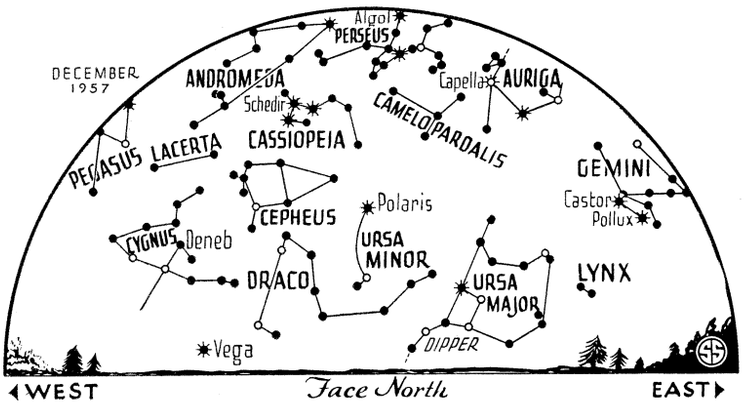
It will not be quite as thin a crescent as that of the moon, but more like the moon some two days later, or about five days after it is new.

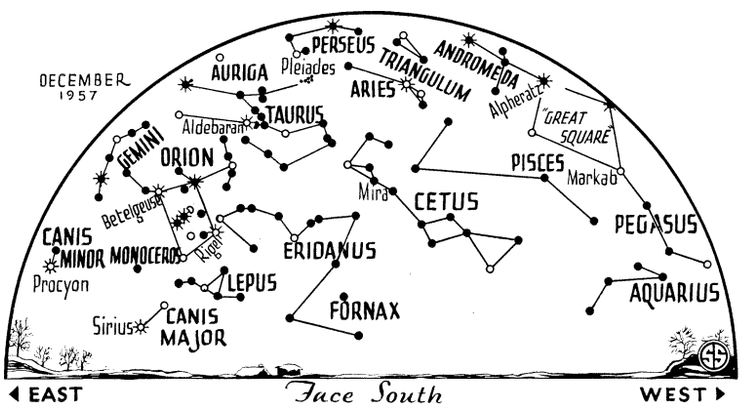
The reason for the lunar phases is found in the fact that, as the moon revolves around the earth, it presents to our view varying amounts of its illuminated hemisphere.

At new, it is practically between the sun and us; the sunlit half is entirely turned away and we see nothing. But a few days later, as the moon swings eastward from the direction of the sun, it remains in the western sky for a while after the sun has set. A narrow sliver of the bright half then appears to us, as a crescent. Then, as it swings still farther away from the sun, half, three-quarters, and finally all, of the sunlit side is presented to us, bringing the full moon.

This takes about two weeks. During the next two weeks the changes occur in reverse order, and the moon is new once again.

Something similar happens to Venus.





☼ ✱ ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

Like the moon, it has no light of its own but is illuminated by the sun, so that one half is bright and the opposite half dark.

Last April 14 it was out beyond the sun, with the entire bright hemisphere turned earthwards. Since then it has been moving and is now coming between the earth and sun. Thus, most of its sunlit hemisphere is turned away, and we have a crescent phase.

On Jan. 28 it will be, nearly, directly between us and the sun, and this will correspond to new moon. After that it will become a crescent again, visible in the morning sky before sunrise.

Unlike the moon, Venus is always so far away that only through a telescope are its phases visible.

The phases of Venus differ from those of the moon in another respect.

As the moon travels around the earth, its distance does not change very greatly, only from about 221,000 miles to 253,000 miles.

Thus there is no great change in its apparent size, and the diameter of the full moon is about the same as when it is in a narrow crescent phase. But when Venus is full it is out far beyond the sun, about 160,000,000 miles away. Just before Christmas it will be less than 40,000,000 miles away, and on Jan. 28 its distance will be about 26,000,000 miles. Thus, as it gets near the "new" phase, it is much larger, seemingly, in the sky.

That is why it is brightest when a crescent. Although less than half of the bright side is visible to us, its proximity more than makes up for this, and the part we can see fills the largest area of the sky. Then it is at the greatest brilliance.

Winter Arrives

On Dec. 21 the sun, which has apparently been traveling southward in the sky since last June, reaches its southernmost point. This is the winter solstice—the beginning of winter in the Northern Hemisphere—and it occurs at 9:49 p. m., EST.

At that moment the sun will be directly over a point near the eastern edge of the Arunta Desert, which is in Australia, on the border between Queensland and the Northern Territory. In Australia, and other southern countries, the sun will be high in the sky, marking summer's beginning.

Celestial Time Table for December

Dec. EST

3	6:10 p.m.	Algol (variable star in Perseus) at minimum brightness.
7	1:16 a.m.	Full moon.
8	10:00 p.m.	Saturn on far side of sun, distance 1,030,000,000 miles.
13	early a.m.	Geminid meteor shower, meteors apparently radiating from constellation of Gemini.
	midnight	Moon nearest, distance 230,100 miles.
14	12:45 a.m.	Moon in last quarter.
16	12:57 p.m.	Moon passes Jupiter.
18	2:15 a.m.	Algol at minimum.
	3:56 p.m.	Moon passes Mars.
20	11:04 p.m.	Algol at minimum.
21	1:12 a.m.	New Moon.
	9:49 p.m.	Winter commences in Northern Hemisphere.
23	7:53 p.m.	Algol at minimum.
	11:00 p.m.	Venus at greatest brilliancy.
24	1:27 p.m.	Moon passes Venus.
27	11:00 p.m.	Moon farthest, distance 251,300 miles.
28	11:52 p.m.	Moon in first quarter.

Subtract one hour for CST, two hours for MST, and three for PST.

Science News Letter, November 23, 1957

GEOPHYSICS

Sputniks in Collision Seen Extremely Unlikely

➤ THE CHANCES of sputniks and other earth satellites colliding in space are just about zero, so unlikely that no one in the U. S. satellite program has bothered to calculate them.

Dr. S. F. Singer, University of Maryland physicist and member of the rocketry committee for the U. S. International Geophysical Year, estimated a collision might occur once every few hundred million years.

"Space is extremely big," Dr. Homer E. Newell of the Naval Research Laboratory, vice chairman of the rocketry committee, said. He pointed out that even on the oceans where thousands of ships sail, collisions at sea are very rare and usually occur only near ports.

"When you go out into space several hundred miles," Dr. Newell said, "the area is just that much bigger." There are also three dimensions, not just two, in which to maneuver, thus reducing the possibilities of collision very much more.

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