

## ASTRONOMY

# Venus and Jupiter Visible

You can see lovely Venus from one and a half to two and a half hours after sunset after twilight has ended. Jupiter, not nearly so bright, still is brighter than stars.

By JAMES STOKLEY

► THE TWO brightest planets, Venus and Jupiter, are now both visible in the evening sky.

Venus, the more brilliant, has been there since late summer, but so low as the sun went down that it was only seen during the twilight period. It set before the sky was really dark. With the coming of November, Venus remains in the sky for more than an hour and a half after sunset, well after twilight has ended.

By the end of the month, Venus will set some two and a half hours after the sun, and will be a conspicuous object in the southwestern sky in the early evening.

Jupiter, about a third the brilliance of Venus but far brighter than any other star or planet, has come into the evening sky from the later hours. During the summer, it rose around midnight, but each month its rising has been earlier.

On Nov. 8, it is at opposition—directly opposite the sun—so then it rises in the east as the sun sets in the west, and sets at sunrise, thereby remaining visible the entire night.

In the early evening of November, it will be possible to see Venus in the southwest, in the constellation of Sagittarius, the archer; and Jupiter in the southeast, in Aries, the ram.

The accompanying maps show the appearance of the sky at about ten p.m., standard time, on the first of November; an hour earlier on the 15th, and two hours earlier on the 30th. These times are a little too late for Venus, so that planet is not shown, though Jupiter is indicated, high in the southeast.

## Mars Much Fainter

The planet Mars is also visible these evenings, but much fainter than Venus or Jupiter, for it is about as bright as a typical first-magnitude star. It is in the southwest, a little to the east of Venus, in the constellation of Sagittarius, at the beginning of November.

Mars' eastward motion, however, takes it next-door into Capricornus, the sea-goat. Thus, for its position at the end of November, it just gets on our map of the southern sky.

Mercury, too, is in the evening sky around Nov. 9, but sets less than an hour after sunset, and will hardly be visible. Saturn is seen much later in the night, to the southeast in Virgo, the virgin. On Nov. 1, it

rises about an hour and a half before sunrise, and about three and a half hours before the sun at the end of the month.

Brightest star of the November evening is Vega, in Lyra, the lyre, toward the northwest. Immediately above this group is Cygnus, the swan, part of which forms the northern cross, standing almost upright, with the bright star Deneb at the top.

To the left of Lyra is Aquila, the eagle, of which the star Altair is part. Low in the south, we can see Fomalhaut, about the only star of Piscis Austrinus, the southern fish, that is easily visible in these latitudes.

## Look for Orion's Belt

Toward the east, as shown on the maps, there now appears a group of bright stars which make the evening skies of winter so brilliant. Look first for the three fainter stars, in a vertical row, that form the belt of Orion, the warrior. To the right is Rigel, and to the left is Betelgeuse, both of the same constellation.

Above Orion is Taurus, the Bull, with the red star Aldebaran. To the left of Taurus we find Auriga, the charioteer, in which Capella stands.

Now that Venus and Jupiter have made their appearance in the evening sky—the one in the west and the other in the east—it will be interesting to watch their movements during the coming months. Venus will continue to draw to the east of the sun, and to set later and later after sunset, until the end of January, when it will start to approach the sun again.

Even then, however, it will continue to brighten, reaching greatest brilliancy on March 8. After that, it will quickly dis-

appear from the evening sky, passing the sun on April 13, and soon thereafter will reappear as a morning star in the east before sunrise. On May 19, its brilliance will again be at its maximum.

Jupiter, at present, is moving in a westerly direction through the sky, which you can observe if you compare its position from time to time with nearby stars, so it is approaching Venus, moving in an easterly direction.

On Jan. 5, Jupiter will halt its westward motion, turn around and then move eastward. By the first of February, it will be high in the south at sunset.

The sun's own movement in the sky will bring it nearer and nearer to Jupiter. That planet will set earlier and earlier, until on May 25 it will go down with the sun. By early summer, it too will be a morning star, and on July 22 Venus will pass it.

By December, 1953, Jupiter will again be opposite the sun, and, as now, will once more be visible through the night.

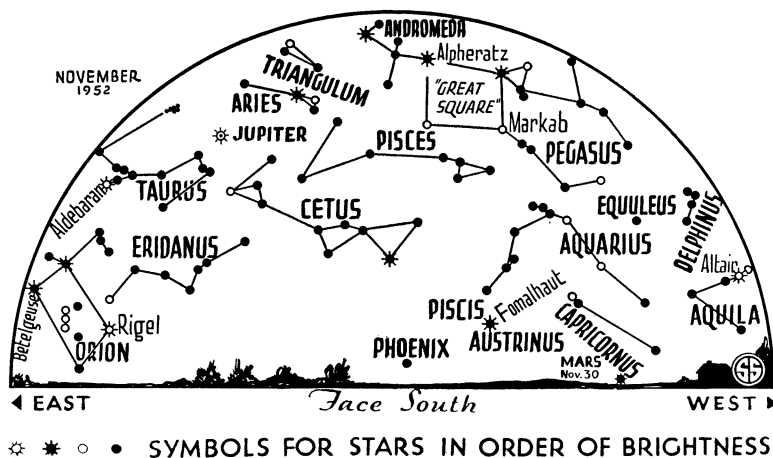
Such movements are rather puzzling unless one appreciates the fact that these planets, as well as our own earth from which we observe them, are all moving around the sun, and at different speeds.

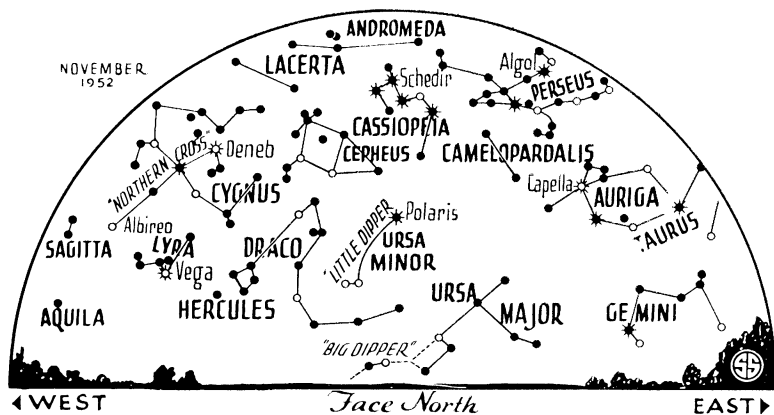
In ancient times even the astronomers, with a few notable exceptions, did not know this, and they had to invent a complicated mechanism, because they thought the earth was fixed and that all the planets, as well as the sun, revolved around us.

## Earth Travels Faster

The average speed of the earth in its orbit is 18.5 miles per second, while that of Jupiter is only 8 miles per second. Now that we are both in the same direction from the sun, we are overtaking that giant planet, much as an express train might pass a slow freight on the next track.

Just as the freight train might seem, to a passenger on the express, to be going back-





- Meteor shower radiating from constellation of Leo.
- 17 7:56 a.m. New moon.
- 18 10:15 p.m. Algol at minimum.
- 20 6:11 a.m. Moon passes Venus.
- 21 7:04 p.m. Algol at minimum.
- 22 12:28 a.m. Moon passes Mars.
- 23 3:00 a.m. Moon nearest, distance 230,000 miles.
- 24 6:34 a.m. Moon at first quarter.
- 29 12:28 p.m. Moon passes Jupiter.
- 30 6:00 a.m. Mercury between earth and sun.

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

Science News Letter, October 25, 1952

The blue goose migrates south to the Gulf of Mexico in the fall; each spring it flies northward to Baffin Island just above the Arctic Circle.

wards, so does Jupiter seem to be in reverse, or retrograde, motion to passengers on the earth. By next January, we will be far enough ahead, and around the curve of our orbit, so that we will see Jupiter moving to the east, as it really is doing all the time.

Venus, on the other hand, is closer to the sun than we are and travels around at an orbital speed of 22 miles a second. Last June, Venus was behind the sun, but then it swung to the east of that great orb, and began to be visible in the west after sunset, catching up to the earth by virtue of its greater speed.

Next Jan. 31, Venus will be farthest east of the sun, setting latest, after which the two bodies will start drawing together again, and on April 13 will come between the sun and the earth. It will then be overtaking us at a speed of about 4 miles per second. To an observer on Venus, the earth would then seem to be going backwards in the sky, just as Jupiter is now doing for us.

**Changes Phase**

Since Venus is sometimes nearer to us than the sun is, its sunlit half is then largely turned away from us. At such times, viewed through a telescope, Venus appears like the crescent moon. At other times, when Venus is farther than the sun, it is more like the full moon, for we can see most if not all of its bright hemisphere.

When Galileo, in Italy about 340 years ago, discovered that Venus went through a complete change of phase, just as the moon did, he provided very conclusive proof of the ideas of Copernicus—that the earth revolved around the sun.

Under the older theory, Venus could never be beyond the sun; hence, could never show a full phase, but would always be more or less of a crescent.

**Celestial Timetable for November**

- Nov. EST
- 1 6:10 p.m. Full moon.
  - 2 9:54 a.m. Moon passes Jupiter.
  - 8 4:00 a.m. Jupiter opposite sun and nearest earth, distance 371,000,000 miles.
  - 9 10:43 a.m. Moon in last quarter.
  - 10:00 p.m. Mercury farthest east of sun.
  - 10. 1:00 a.m. Moon farthest, distance 251,200 miles.

- 15 12:44 a.m. Moon passes Saturn.
- 16 1:26 a.m. Algol (variable star in Perseus) at minimum brightness (during evening and early morning of 17th).

Very few forest-soil nutrients are removed when timber is harvested; most of them are stored in tree leaves which are left in the forest.

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