

ASTRONOMY

Jupiter Now Brilliant

Jupiter is the planet now dominating the evening sky. Mercury scheduled to pass across the face of the sun, an event occurring about 13 times a century, on Nov. 14.

By JAMES STOKLEY

► JUPITER IS now moving into a better position, for it will rise about two hours after sunset on November evenings, and remain brilliantly visible through the rest of the night.

It outshines all of the stars that are seen, and the planets as well, with the exception of Venus, which rises in the east just before dawn is breaking.

The position of Jupiter in the eastern sky, in the constellation of Taurus, the bull, is indicated on the accompanying maps. These depict the heavens as they look about 10:00 p.m., your own kind of standard time, at the first of November, about 9:00 p.m. at the middle and 8:00 p.m. at the end of the month.

Just to the left of Jupiter, in the constellation of Auriga, the charioteer, is Capella, one of the brightest stars now visible, though Jupiter exceeds it by about ten times.

To the right of the planet, in Taurus itself, is Aldebaran, a star of the first magnitude on the astronomical scale, although less than half as bright as Capella. It is noticeably red in color.

Underneath Taurus is Orion, the warrior, just above the horizon. Its low altitude somewhat dims the brilliance of its two first-magnitude stars, Betelgeuse and Rigel. During mid-winter evenings this group will shine prominently, high in the south.

Late Summer Stars Seen

Toward the west some stars that were prominent in the late summer and early autumn can still be seen, as they are getting ready to disappear from view in the evening sky. One of these is Vega, in Lyra, the lyre, toward the northwest, and directly above is Cygnus, the swan, in which Deneb shines, at the top of the "northern cross."

Aquila, the eagle, with the star Altair, is a little to the left of Lyra. Finally, Fomalhaut, in Piscis Austrinus, the southern fish, appears low in the south.

Its stars are not of the first magnitude, but a prominent "skymark," seen high in the south, helps one to find his way among the constellations. This is the "great square," three of whose stars are in Pegasus, the winged horse. The fourth, at the upper left, is Alpheratz, in Andromeda, the chained princess.

Pisces, the fishes, are below the square,

toward the left, and below them is the sprawling group of Cetus, the whale.

In the northern sky the great dipper, part of Ursa Major, the great bear, is close to the horizon, in its poorest position of the year. Above it is the little dipper, in Ursa Minor, the lesser bear, of which the pole star is a part. Still higher are Cepheus, the king, and Cassiopeia, the queen, the parents, according to mythology, of Andromeda.

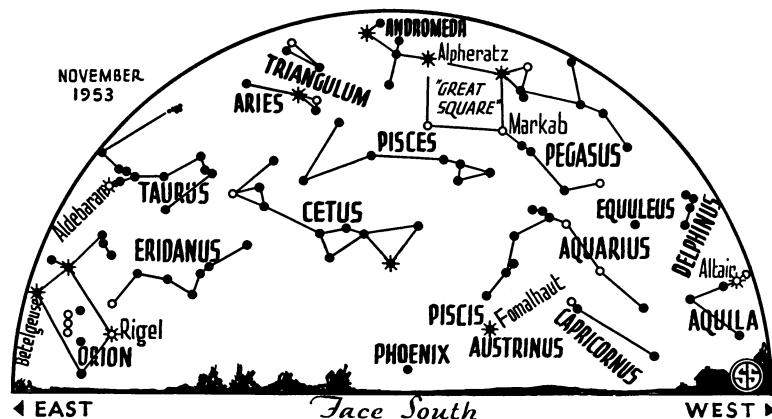
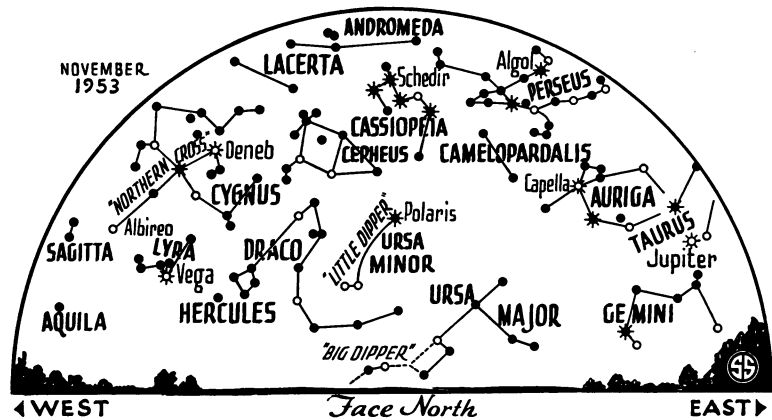
In addition to Venus, already mentioned as a "morning star," a planet that rises before the sun, Saturn can also be seen in the early morning hours. Indeed, Venus passes it on Nov. 13, but before they become visible in the U. S. Mars, too, is seen at the same time, as it rises in the east about three hours ahead of the sun.

At the very end of November and the beginning of December, Mercury also will appear low in the east as dawn approaches. However, on Nov. 14 it will do something

much more rare, when it passes across the face of the sun, between the hours of 10:37 a.m., EST, and 1:12 p.m. (9:37 a.m.-12:12 p.m. CST, 8:37-11:12 a.m. MST, and 7:37-10:12 a.m. PST). This is called a transit of Mercury, but unfortunately it will not be visible to the unaided eye, even though protected by the smoked glass or dense photographic negative that must be used to observe the sun. However, a small telescope, if equipped with proper protection for the eyes against the glare, will reveal it as a tiny black spot on the upper part of the solar disk.

Instead of revolving around the sun once in 365¼ days, as the earth does, Mercury revolves around it in 88 days. However, while it makes such a circuit, the earth has traversed more than a quarter of its own orbit, so not until 116 days have passed, on the average, does Mercury catch up with the earth. This is called its "synodic" period.

When Mercury is in the same direction from the sun as the earth, it is said to be in inferior conjunction. Superior conjunction occurs when it is in the opposite direction from that of earth. But while an inferior conjunction occurs about every 116 days, at



such a time Mercury is generally either north or south of the line joining our two planets, and thus fails to come directly between the earth and the sun.

In November and May, the earth is in the same direction from the sun as the place where the orbit of Mercury passes through the plane of the earth's orbit. Thus, if a conjunction occurs in these months, there may be a transit, with Mercury passing directly in front of the sun as seen from our planet. In May, however, Mercury is considerably farther away from the sun than in November, so May transits are about half as frequent as those toward the end of the year.

Check on Planet's Motion

The chief value of a transit of Mercury is the opportunity it gives to check accurately the movement of the planet. However, a transit of Venus across the sun has been used to give a very accurate value for the distance of the sun from the earth.

Transits of Venus are much rarer than of Mercury. They can only occur about June 7 or Dec. 8. They may, as they have been doing in recent centuries, occur in pairs. There was such a pair in June 1761 and 1769, and again in December 1874 and 1882. There will be none during the twentieth century. The next will occur June 8, 2004, and June 6, 2012, so that only the youngest of our contemporaries are likely to see them.

There cannot, of course, be transits of any other planets, besides Mercury and Venus, for these are the only ones that move around the sun in orbits smaller than ours. However, if there were astronomers on Mars, they could see a transit of the earth, although it would be considerably rarer than one of Venus for us.

Celestial Time Table for November

Nov. EST	
2	9:00 p.m. Moon farthest, distance 252,200 miles.
3	4:14 a.m. Moon passes Mars. 5:45 p.m. Algol (variable star in Perseus) at minimum brightness.
4	9:55 p.m. Moon passes Venus.
5	5:52 p.m. Moon passes Saturn.
6	12:58 p.m. New moon.
10	Meteors visible radiating from constellation of Taurus.
13	11:00 p.m. Venus passes Saturn.
14	2:52 a.m. Moon in first quarter. 10:37 a.m. Transit of Mercury (See text).
16	Meteors visible radiating from constellation of Leo.
18	1:50 a.m. Algol at minimum. 6:00 p.m. Moon nearest, distance 225,200 miles.
20	6:12 p.m. Full moon. 10:39 p.m. Algol at minimum.
22	1:34 p.m. Moon passes Jupiter.
23	12:00 noon Mercury passes Venus. 7:28 p.m. Algol at minimum.
28	3:16 a.m. Moon in last quarter.
30	1:00 p.m. Moon farthest, distance 251,600 miles.

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



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