

ASTRONOMY

Jupiter Still Conspicuous

The planet Jupiter, the most brilliant object in the November sky except for the moon, shines in the constellation of Pisces with a brightness 20 times that of Saturn.

By JAMES STOKLEY

► THE MOST BRILLIANT and conspicuous object in the November evening sky—except for the moon—is the planet Jupiter. With a stellar magnitude of minus 2.4, Jupiter exceeds by nearly 20 times the brightness of Saturn, which is also visible with a brightness equal to a first magnitude star.

Both planets are shown on the accompanying maps, which depict the skies as they look about 10:00 p.m. (your own kind of standard time) at the first of November. They look about the same at 9:00 p.m. on the 15th and at 8:00 p.m. when the month ends.

The "Great Square"

Jupiter is in the rather inconspicuous constellation of Pisces, the fishes; Saturn is in Capricornus, the horned goat. Just above the western end of Pisces is Pegasus, the winged horse. Here you see the figure known as the "great square." Three of its stars are in Pegasus; the fourth, in the upper left-hand corner, is Alpheratz of neighboring Andromeda.

But the brightest stars now visible are in the east, and in the west. In the western sky stands the "northern cross" with the star called Deneb at the top. Actually, this is the constellation of Cygnus, the swan, with Deneb marking the bird's tail. The crosspiece forms the wings, and the lower vertical part his long neck stretched forward in flight.

To the right of the cross and a little lower is Vega, in Lyra, the lyre. Altair, in Aquila, the eagle, is to the left of the cross.

Over in the east are several of the constellations that will shine brightly in the southern evening sky during the winter months. In Taurus, the bull, appears Aldebaran, distinctly red in color. A little to the left is Capella, in Auriga, the charioteer.

Below Taurus is Orion, the warrior. The three stars in a vertical row form his belt. Rigel, to the right, is in one foot; Betelgeuse, to the left, marks one of his shoulders.

In the north Cassiopeia, the queen, shines high. This group now forms a letter M. Below it is Ursa Minor, the lesser bear, of which Polaris, the pole star, is part. And still lower is Ursa Major, the great bear, of which the big dipper is part. However, it is now so low that it is not easily seen.

Low in the west, just after sunset, and before the sky is entirely dark, you may be able to see a third planet: Venus. At the beginning of November it sets a little more than half an hour after the sun. By Christmas, however, it will set more than two

hours after sunset. It will then be a conspicuous object, shining even brighter than Jupiter.

Mars and Mercury, the other planets which may be visible to the naked eye, are now too nearly in the same direction as the sun to be observable.

If you watch the moon night after night, as it moves across the sky and changes phase—from new to first quarter, then to full, last quarter and back to new, you will find that it always passes through the same constellations. And these are also the star groups in which the planets appear. One, of course, is Pisces, where you now observe Jupiter; another is Capricornus, now the location of Saturn.

Several others also are visible on November evenings: Aquarius, the water carrier, between Pisces and Capricornus; Aries, the ram, and Taurus, the bull, in the southeast; and Gemini, the twins, low in the northeast. These are six of the 12 constellations that mark the zodiac, the sky-encircling band in which the sun, moon and planets always seem to be.

Actually the constellations merely form the far-distant background, for the planets and the sun are tens or hundreds of millions of miles away; the stars tens or hundreds of trillions of miles.

The earth is about 93 million miles from the sun, and we go around it every year. Thus, at different times, the sun is against a different background of stars. They cannot, of course, be seen on account of the sun's glare. Early last April the sun was about where we now see Jupiter. Since the moon and planets travel around the sun in orbits that are approximately in the same plane as the earth's orbit, they too appear against the same background constellations.

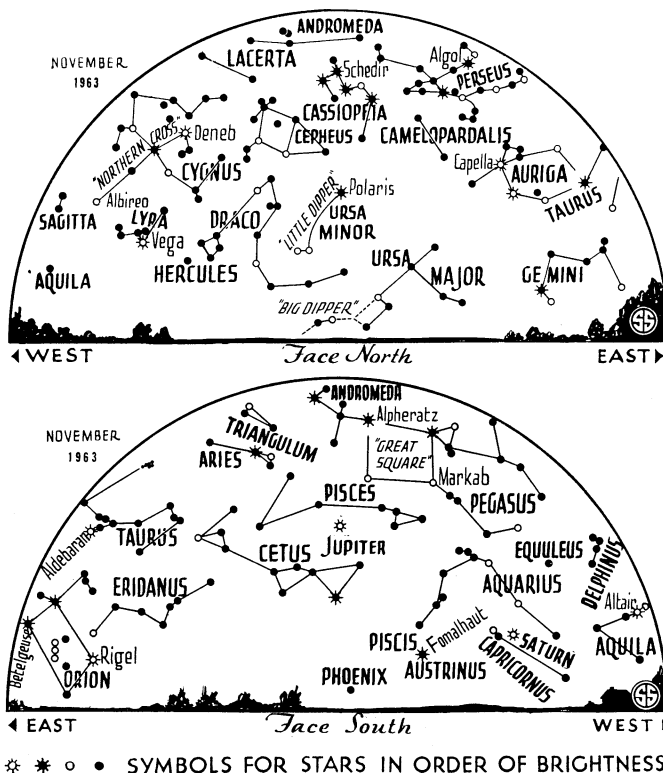
Twelve Constellations

In addition to the six shown on our maps for November, there are also Cancer, the crab; Leo, the lion; Virgo, the virgin; Libra, the scales; Scorpio, the scorpion, and Sagittarius, the archer. Aries is usually considered the first, so the full list is Aries, Taurus, Gemini, Cancer, Leo, Virgo, Libra, Scorpio, Sagittarius, Capricornus, Aquarius and Pisces.

A help to remembering them is a little verse written 200 years ago by a famous hymn writer, Isaac Watts. Among others, he wrote "Oh God, our help in ages past." Here is the verse about the zodiac:

"The Ram, the Bull, the Heavenly Twins,
Beneath the Crab the Lion shines,
The Virgin and the Scales.
The Scorpion, Archer and He-Goat,
The Man that pours the Water out,
And Fish with glittering tails."

The constellations of the zodiac are not



the same as the "signs of the zodiac," even though they have the same names. Several thousand years ago men divided the path of the planets into 12 equal sections. They called these the signs, and named them after the principal constellations. But there is a slow movement in the sky, called "precession" (not procession), whereby the constellations slip completely around in about 26,000 years. Now signs and constellations do not correspond; the sign of Aries is in the constellation of Pisces.

And actually parts of 14 other constellations extend into the zodiac to some extent. The principal ones are Orphiuchus, the serpent-bearer; Orion; Cetus, the whale; and Auriga.

Celestial Time Table for November

NOV.	EST	
1	8:56 a.m.	Full moon
	7:00 p.m.	Moon nearest, distance 221,800 miles
	9:32 p.m.	Algol (variable star in Perseus) at minimum brightness
4	6:21 p.m.	Algol at minimum
8	1:37 a.m.	Moon in last quarter
16	1:00 a.m.	Moon farthest, distance 252,700 miles
	1:51 a.m.	New moon
17	early a.m.	Shooting stars (meteors) seen, apparently radiating from Leo
	11:00 p.m.	Moon passes Venus
19	2:26 a.m.	Algol at minimum
21	11:15 p.m.	Algol at minimum
22	Midnight	Moon passes Saturn
24	2:56 a.m.	Moon in first quarter
	8:04 p.m.	Algol at minimum
26	7:00 p.m.	Moon passes Jupiter
30	8:00 a.m.	Moon nearest, distance 221,800 miles
	6:55 p.m.	Full moon

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

• Science News Letter, 84:266 Oct. 26, 1963

TECHNOLOGY

Infrared Binoculars Mounted on Helmet

► INFRARED BINOCULARS that are helmet-mounted so a driver has both hands for steering are now undergoing check tests at Fort Belvoir, Va., for the U.S. Army.

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• Science News Letter, 84:267 Oct. 26, 1963

Do You Know?

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There were about 1,000 more cases of *smallpox* reported in the Western Hemisphere during 1962 than in 1961.

• Science News Letter, 84:267 Oct. 26, 1963

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