

ASTRONOMY

# Venus Shines in West

All of the naked-eye planets are visible in November evening skies but Mars and Mercury will be difficult to see because they will set so early.

By JAMES STOKLEY

► ALL FIVE OF THE NAKED-EYE planets, Venus, Jupiter, Saturn, Mars and Mercury, are in the evening sky during November, but the last two mentioned will be very difficult to see.

Venus is low in the southwest as darkness falls, and so brilliant that it can be found easily. However, it sets about two hours after sunset, and so does not appear on the accompanying maps.

The maps picture the sky as it looks about 10:00 p.m., your own kind of standard time, at the first of November, 9:00 p.m. at mid-month, and 8:00 p.m. at the end of the month.

Next to Venus, the most prominent planet is Jupiter, which rises soon after sunset and remains visible until dawn. It is in the constellation of Gemini, the twins.

### Saturn in South

As twilight ends, about 6:00 p.m. or a little later, you will see Saturn in the south, in Aquarius, the water carrier. It sets a little after midnight. Saturn is as bright as a first magnitude star. Venus is more than a hundred times brighter than Saturn.

Just after sunset Mars and Mercury are very low in the southwest. Both will set before the sky gets dark enough for them to be easily seen.

The brilliant constellations of the mid-winter evening are now beginning to appear in the east. Jupiter appears in Gemini, the twins. Pollux is the bright star below Jupiter and toward the left.

Above Jupiter is Auriga, the charioteer, with brilliant Capella. To the right of this group is Taurus, the bull (shown mainly on the map of the southern half of the sky), with the red star called Aldebaran. Below Taurus is Orion, the warrior, with two first magnitude stars: Betelgeuse and Rigel. Between them is a vertical row of three stars that form Orion's belt.

In the west you can still see some of the stars that were high overhead on summer evenings. There is the "summer triangle," composed of Deneb at the top of the Northern Cross, which is part of Cygnus, the swan; Vega, in Lyra, the lyre; and Altair, to the left, in Aquila, the eagle.

### Fomalhaut Brightest in Pisces

Low in the south, approximately below Saturn, is Fomalhaut, the brightest star in the constellation of Pisces Austrinus, the southern fish. Above Saturn is Pegasus, the winged horse, with four stars marking the "Great Square." Alpheratz, the star in the upper left corner, is actually in the neigh-

boring constellation of Andromeda, the legendary chained princess, which extends into the northern sky map. Beneath Andromeda in the north, are Cassiopeia, who was her mother according to the myth, and Cepheus, her father.

To Cassiopeia's right stands Perseus, the hero who rescued Andromeda. In Perseus is Algol, a famed variable star. Every 2 days and 21 hours its light fades to about a third of its normal brightness. Algol is actually a double star, and the bright one becomes partially eclipsed by the darker component.

### Many Shooting Stars

If the eastern sky during the night of Nov. 16 is clear, you will probably see more than the usual number of meteors or "shooting stars." After midnight there will be more, but the moon, at last quarter, will then have risen, and its glare will hide the fainter meteors.

A meteor is really a small bit of cosmic debris that enters the earth's atmosphere at high speed, where it is heated to incandescence and then disappears in a flash of light. As it flies through the air, it excites atmospheric gases to glow, which accounts for most of the light.

On any night of the year a few meteors

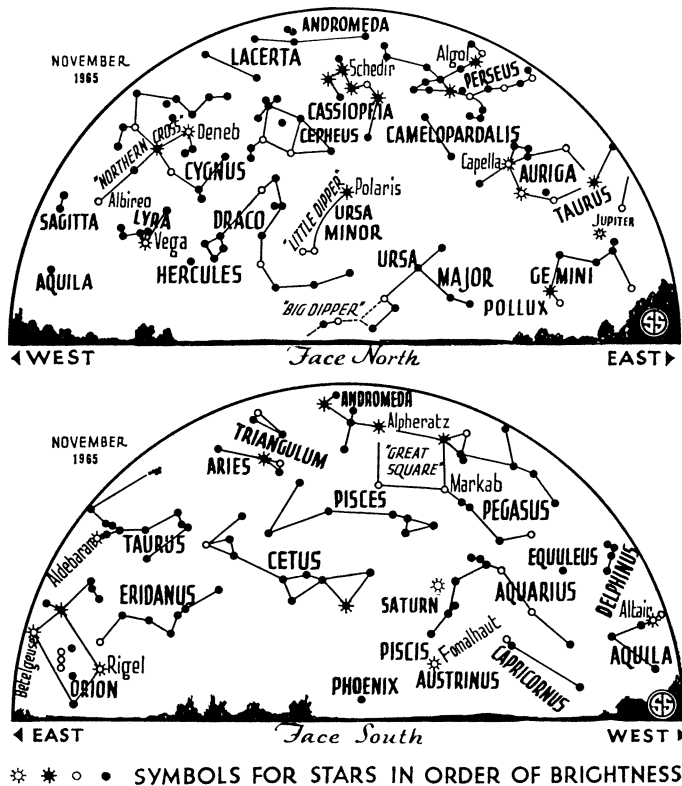
are visible, more of them are visible after midnight than before because we are then on the forward side of the earth as it revolves around the sun. The meteors meet us head-on, while in the evening hours we are on the trailing side of the earth and meteors must catch up to us.

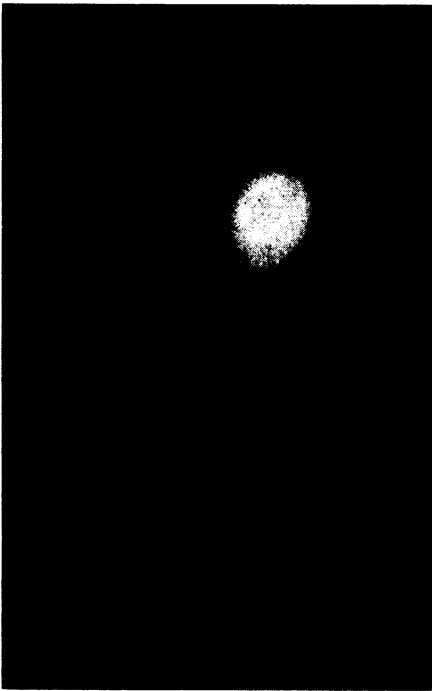
At various times during the year there are meteor showers, when shooting stars are more numerous—perhaps one every minute instead of one an hour. There have been rare occasions—as in 1833, the year the "star fell on Alabama"—when they have fallen so fast that they resemble snowflakes.

One of these showers will occur Nov. 16, when all the shooting stars seem to emerge from one part of the sky, in Leo, the lion. This constellation rises soon after midnight in November. Actually the apparent emergence from this part of the sky is an effect of perspective. The paths of the meteors are parallel, although they seem to converge in the distance. In the same way the parallel tracks of a railroad seem to come together at the horizon.

### Meteors Radiating from Leo

Because they radiate from Leo, these meteors are called Leonids. They move constantly around the sun in an elliptical stream which the earth crosses every November. At one place in the stream there are many more meteors than elsewhere. In 1833 and again in 1866 the earth encountered this dense concentration, so the meteors were particularly numerous. By 1899,





Lick Observatory, University of California

**COMET IKEYA-SEKI**—This comet, discovered by Kaoru Ikeya and T. Seki, amateur Japanese astronomers, was on its most brilliant display Oct. 20 when it reached perihelion, the point at which it was closest to the sun. It is now heading farther out into space and will disappear from view sometime in 1966.

when another prominent display was expected, the dense swarm had passed close to Jupiter, and the gravitational pull of that planet changed the paths of the Leonids.

Every November we can see some of these meteors, so watch for them this year. The bright moonlight after midnight makes conditions somewhat unfavorable, but, as the 1965 Handbook of the British Astronomical Association points out, the Leonid shower usually has a high proportion of bright meteors, so it will still be worthwhile to keep watch.

November brings the year's third eclipse, on Nov. 23, which is not visible in this part of the world. Our troops in Viet Nam will be able to see it, however. The path along which it is visible starts in Afghanistan, then goes to the southeast across Pakistan, India, Nepal, Burma, Thailand and Viet Nam. After that it crosses the South China Sea and the islands of Borneo and New Guinea, before it ends in the Pacific Ocean near the Gilbert Islands.

This will be an annular eclipse; that is, the moon will be too far away to hide the sun completely. At the height of the eclipse, a ring of the solar disk will be visible around the dark moon. Over a large area, which includes most of southern Asia as well as Australia, people will see a partial eclipse.

### Celestial Timetable for November

NOV. EST

- 1 3:26 a.m. Moon in first quarter
- 10:00 a.m. Moon farthest, distance 251,200 miles

- 2 1:00 a.m. Algol (variable star in Perseus) at minimum brightness
- 3 5:00 p.m. Moon passes south of Saturn
- 4 9:50 p.m. Algol at minimum
- 7 6:30 p.m. Algol at minimum
- 8 11:16 p.m. Full moon
- 12 3:00 a.m. Moon passes north of Jupiter
- 10:00 p.m. Mercury farthest east of sun
- 14 3:00 a.m. Moon nearest, distance 229,600 miles
- 15 3:00 p.m. Venus farthest east of sun
- 8:54 p.m. Moon in last quarter
- 17 early a.m. Meteors of Leonid shower at maximum
- 22 2:40 a.m. Algol at minimum
- 11:10 p.m. New moon, annular eclipse of sun, visible in Asia
- 24 11:30 p.m. Algol at minimum
- 25 midnight Moon passes south of Mars
- 27 1:00 a.m. Moon passes south of Venus
- 8:20 p.m. Algol at minimum
- 29 7:00 a.m. Moon farthest, distance 251,500 miles
- 30 5:10 p.m. Algol at minimum

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

• Science News Letter, 88:266 October 23, 1965

## Nature Note

### Flatworms

➤ A LITTLE HIGHER up the scale of animal development from the jellyfish, anemone and corals of the phylum Coelenterata is the group known as the Platyhelminthes or flatworms. There are more than 9,000 species of these flat creatures and they are widely distributed throughout the world.

The flatworm phylum is divided into three classes: the free-living or true flatworms, and the two parasitic classes—the flukes and the tapeworms.

One of the more common true flatworms is the seemingly cross-eyed creature called *planarium*, a flat brownish worm about half an inch long and much studied and experimented upon in laboratories. Its tri-pointed head has two pigment-cup eyes placed on two light-sensory lobes in such a way that the worm looks comically cross-eyed. These light-sensitive eyes are the first traces of eyes to appear in the lower animals. One side of the animal is similar to the other side—an example of bilateral symmetry in the evolution of animal form.

The trematoda or flukes live as parasites on many species of animals, and cause many serious diseases. Some live in livers, others in lungs and still others in the bloodstream. Looking somewhat like planarians, the flukes have two or more suckers for attaching themselves to and feeding upon their hosts.

Tapeworms are long ribbon-like worms that almost always live inside the intestines of animals and humans. Some grow to enormous lengths of 50 or more feet. These unpleasant creatures have no mouths or digestive apparatus—they just absorb much of their nutrition directly through their body wall from the intestinal contents of their host. A tapeworm's head is equipped with suckers or hooks to attach itself. Behind these stretch a whole series of sectional pieces, each one capable of reproducing sperms and eggs. When they grow to maturity, these pieces break off and pass out of the host animal.

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