

ASTRONOMY

Venus, Evening Star

Saturn and Jupiter are the only other planets now visible during the night. The stars are the main spectacle during October.

By JAMES STOKLEY

➤ ONCE AGAIN we are beginning to have a bright evening star. After the sun has set, look to the southwest as the sky darkens and, if it is clear, you should be rewarded by seeing a brilliant point of light which is the planet Venus. This month it sets about an hour and a quarter after the sun but it is gradually moving eastward through the sky. So is the sun, for that matter, but Venus is going more rapidly. This means that it is drawing away from the sun, and so it remains visible each night a little longer after the sun has gone down. During the coming winter it will be easily visible even after the sky is completely dark.

Because Venus sets so early, it does not appear on the accompanying maps. These show the appearance of the skies, in your local standard war time, at about 11:00 p.m. on Oct. 1, and about 10:00 p.m. on the 15th. There is another planet visible in the evenings this month, but it too fails to get on the map, this time because it rises too late.

Around midnight, if you look to the northeast, you will see the constellation of Gemini, the twins, rising. In this group, besides the two bright stars, Castor and Pollux, there will be a third brilliant object, though not nearly equal to Venus. This is the planet Saturn. It moves rather slowly through the sky, but each month rises about two hours earlier than the previous month so it also is coming into the early evening skies.

Jupiter Visible

The only other planet now visible during the night is Jupiter, which comes up about three hours before the sun, and is some 30 degrees above the southeastern horizon at sunrise. Because of the same effect of rising earlier each month, this too will be in the evening skies during the winter, so we are promised a rather good planetary display at that time.

That leaves the stars themselves as the main spectacle during these October evenings. Most brilliant of them is Vega, in Lyra, the lyre, which is high in the west. Directly above it is Cygnus, the

swan, with first magnitude Deneb. To the left of Vega is Aquila, the eagle, in which Altair is found. Looking toward the east, we find Taurus, the bull, near the horizon, and in this red Aldebaran is visible. Just to the left of Taurus is Auriga, the charioteer, and in this there is the star Capella, second brightest of those mentioned. Finally, low in the south, is Fomalhaut, in Piscis Austrinus, the southern fish.

High in the south are some characteristic star groups which, though they contain no first magnitude stars, one should know. There are the four stars making up the "great square" of Pegasus, the winged horse. Branching off from the northeast corner of the square is Andromeda, the chained princess, while below and to the east of the square is the figure of Pisces, the fishes. Then, right above Auriga, between him and Andromeda, is Perseus, the mythological hero who rescued Andromeda just as she was about to be devoured by a great sea monster. The monster is represented by Cetus, the whale, just below the fishes.

Others Are Faint

In addition to the planets already mentioned, there are others in the sky, but these are too faint to be seen except with a telescope. Uranus, next planet out beyond Saturn, is in Taurus. Neptune, next beyond Saturn, is in Virgo, the virgin, the group in whose direction the sun now stands. And Pluto, the farthest of all, is in Cancer, the crab, which rises in

the early morning, so is not on maps.

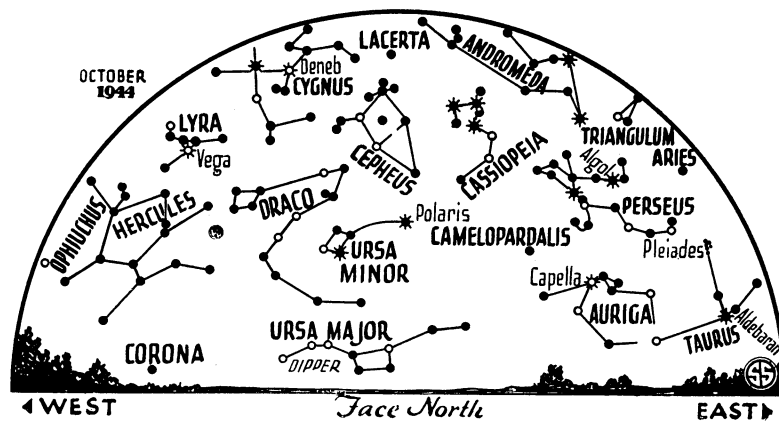
However, there most likely are other "planets" in the sky, which no telescope will show. Of course, there are probably some faint members of our own solar system, even beyond Pluto, which have not yet been discovered, and which may be revealed by future work. But in the constellation of Cygnus there is a body which is probably of planetary nature, and which is not part of our solar system.

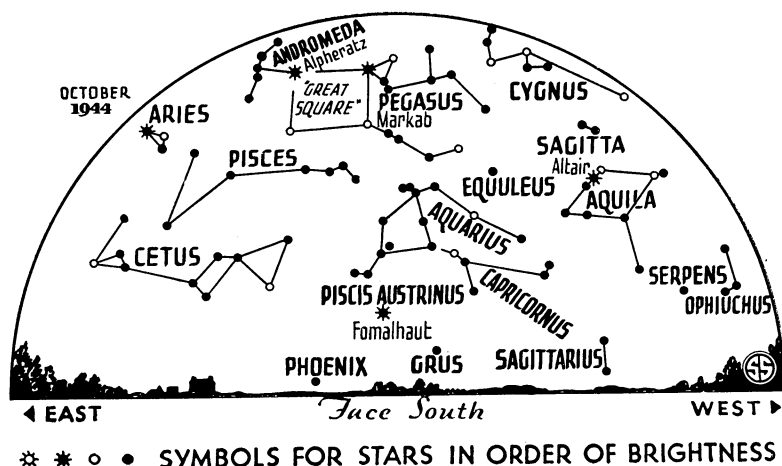
Search for Other Planets

For years, men have realized that our sun is a fairly typical star in most respects, except for the fact that it is surrounded by a family of planets. Why, then, could not other stars have similar planets revolving around them? The difficulties of finding such planets are enormous, for with no light of their own, standing close to a bright glowing orb, no present-day telescope could reveal any of our planets to an astronomer, for instance, on a planet revolving around Sirius, which is one of the closest stars.

Fortunately, there are indirect means of detecting objects in the heavens. Both Neptune and Pluto produced effects on other planets which made it possible for astronomers to know that they were there even before they saw them. Years ago, astronomers found that Sirius, the dog-star, was moving in a wavy sort of path, as if it were pulled first one way, then the other. They realized that some undiscovered body was producing such a pull, and later it was discovered. Though much fainter than Sirius, it is a star, and the two revolve around each other.

Up in the constellation of Cygnus, a





short distance away from Deneb, in the direction toward Pegasus, is a star known as 61 Cygni. It is just about bright enough to be seen with the naked eye on a dark night. This was the first star to have its distance measured, in 1838, by F. W. Bessel, who found that it is about 11 light years away. That is, its light, traveling eleven million miles a minute, takes almost eleven years to reach us. It is thus one of the closest of all stars. It also is a double star. That is, like Sirius, there are two bodies revolving around their center of gravity, but in this case they are nearly of the same brightness.

Found By Mathematics

In studying very accurate photographs of these two stars, Dr. K. Aa. Strand, a Danish astronomer working at the Sproul Observatory, Swarthmore, Pa., found that the movement of one of them was irregular, and decided that there must be a third body revolving around it. By a mathematical analysis, he calculated that it was only about a sixtieth of the sun's mass, and that it goes around its parent star in about 4.9 years.

The least massive star known up to this time was only about a seventh of the sun's, so that the new body is far below a star in mass, and could hardly be classed as stellar. It is only 16 times as massive as the planet Jupiter so Dr. Strand decided that it is a planet rather than a star. This is the first planet, if such it be, to be discovered outside our solar system. Since then other stars have been found to have similar small companions, so it looks as if our planetary family may not be unique, as some have imagined.

In the course of his work, Dr. Strand made some calculations about the two main stars of the 61 Cygni system. He found that their combined mass is

slightly more than the sun's; that they make a complete revolution in 720 years and that they are of the order of 7,000,000,000 miles apart.

Although the presence of the 61 Cygni planet is known as definitely as if it were visible, there is little hope at present for seeing it through telescopes, and even less for finding out anything about its physical nature, much less whether it has any inhabitants. But at least it is a step toward making us less lonely in the universe, for as we look at the constellation of Cygnus we can realize that there at least is another body which is something like the planets around the sun, one of which is our home.

Celestial Time Table for October

Oct.	EWT			
1	1:00 p.m.	Moon nearest,	dist.	222,000 miles
2	12:22 a.m.	Full moon		
8	11:42 a.m.	Moon passes Saturn		
	9:12 p.m.	Moon in last quarter		
10	12:49 a.m.	Algol at minimum		
12	9:38 p.m.	Algol at minimum		
13	8:54 p.m.	Moon passes Jupiter		
14	10:00 a.m.	Moon farthest,	dist.	252,400 miles
15	6:27 p.m.	Algol at minimum		
17	1:35 a.m.	New moon		
19	3:40 p.m.	Moon passes Venus		
22		Meteors of Orionid shower visible		
24	6:48 p.m.	Moon in first quarter		
29	10:00 p.m.	Moon nearest,	dist.	223,800 miles
30	2:31 a.m.	Algol at minimum		
31	9:35 a.m.	Full moon		

Subtract one hour for CWT, two hours for MWT, and three for PWT.

Science News Letter, September 30, 1944

ENGINEERING

Engine Testing Unit Studies 100-Octane Gas

➤ A ROARING airplane engine which could pull a plane through the air as fast as 400 miles an hour, but which will never leave the ground is the center of a new aviation fuels testing unit revealed by the Standard Oil Company (New

Jersey). It is expected that with the new \$500,000 unit, petroleum technologists will be able to speed up the improvement of the 100-octane gasoline now used by the Allied air forces and possibly increase the production of this super-fuel.

Engines exceeding 2,500 horsepower can be operated on the new test stand, the first of its kind built.

The petroleum technologists will study, primarily, the problem of aviation engine knock, the same kind of knock that you hear in the engine of your automobile if the octane rating of the gasoline you are using is too low. In your car, the knock only causes annoyance and steals power from you, but it threatens the aviation engine with destruction in a few seconds.

While the need for anti-knock quality in gasoline for airplanes greatly exceeds the demands of automobile engines, the fuel improvements resulting from the operation of the new testing unit may ultimately make possible the increased power and better performance that car drivers will enjoy.

Flight conditions are simulated by huge blowers which supply air at any desired pressure or temperature within the range experienced at various altitudes.

The operation of the test stand is automatically controlled in an adjoining instrument room which is protected from the intense sound in the test stand room by a 16-inch concrete wall in which there are no doors. For observation, the operators use three windows in the wall, each of which has four panes of glass of varying thickness to minimize sound transmission.

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