

ASTRONOMY

# Four Planets Now Visible

With four of the five planets that can be seen without a telescope visible during June, this month promises an unusual display of naked-eye planets.

By JAMES STOKLEY

THE BEST DISPLAY of naked-eye planets for a considerable length of time is visible on June evenings. Venus, Mars, Jupiter and Saturn, all that are ever visible without a telescope, except for Mercury, can now be seen at the same time. (Mercury is too nearly in the same direction as the sun to be seen.)

All these planets, as well as the brighter stars, are shown on the accompanying maps as they appear about ten p.m., your own kind of standard time (add one hour for daylight saving time) at the first of June, and an hour earlier at the middle of the month (when the sky is actually not very dark).

Long before any other planet or star appears, Venus can be seen in the west. Its magnitude is now minus 3.9 on the astronomer's brightness scale, and it stands in the constellation of Cancer, the crab. On June 15 Venus will be 71,800,000 miles from earth.

## Mars Close to Venus

Close to Venus, when the sky gets darker, you will see Mars. At a distance of 205,400,000 miles, on the 15th, it is only about a hundredth as bright as Venus. On June 1 Venus will be well below Mars; both are moving toward the east and Venus passes Mars on the morning of June 14. They will be invisible in the United States at the time of closest approach, but on the preceding and following evenings they will appear unusually near each other.

Jupiter is the second brightest planet. It is in the south in Libra, the scales, at a distance of 415,000,000 miles. But even though it is so far, its magnitude is minus two, which makes it a little more than a sixth as bright as Venus.

The fourth planet, Saturn, is low in the southeast, in Sagittarius, the archer; its distance is 843,000,000 miles. In magnitude it is plus 0.3, equal to a bright first magnitude star. However, its low altitude makes Saturn appear fainter, because of absorption of its light by the earth's atmosphere.

Among the stars which, unlike the planets, shine with their own light, the brightest is Vega in Lyra, the lyre, high in the east. Below this group is Cygnus, the swan, with first magnitude Deneb. Like Saturn, this is somewhat dimmed because it is rather low in the sky. To the right is Altair, in Aquila, the eagle.

High in the south is Arcturus, in Bootes, the bear-driver. Below it is Virgo, the virgin, with Spica. To the right of this group you will find Leo, the lion, of which

Regulus is the brightest star. Low in the southeast, to the left of Libra, is the scorpion, Scorpius, with first magnitude Antares, another star that is dimmed by its low altitude.

Even more dimmed are two stars shown low in the northwest; Pollux, in Gemini, the twins, and Capella, in Auriga, the charioteer. Both were very prominent in the winter evening sky, but the stars are now about to disappear for a "summer vacation."

On Sunday, June 21, at 10.50 p.m. EST (9:50 p.m., CST; 8:50 p.m., MST; 7:50 p.m. PST; add one hour to each for corresponding DST) the sun reaches its farthest north position for the year, when it will be over the Tropic of Cancer. Actually, at that moment, it will be directly over a point in the Pacific Ocean, off the island of Formosa. This is the time of the summer solstice, which marks the beginning of summer in the Northern Hemisphere. In the Southern Hemisphere, it is the beginning of winter.

With four planets visible in June in the evening sky, and the earth, as always, visible at our feet, we can see a considerable part of the solar system.

One striking feature of this family of

planets which revolve around the sun, and one that few appreciate, is that it is mostly empty space. This makes it quite impractical to construct an accurate model, although many models have been made.

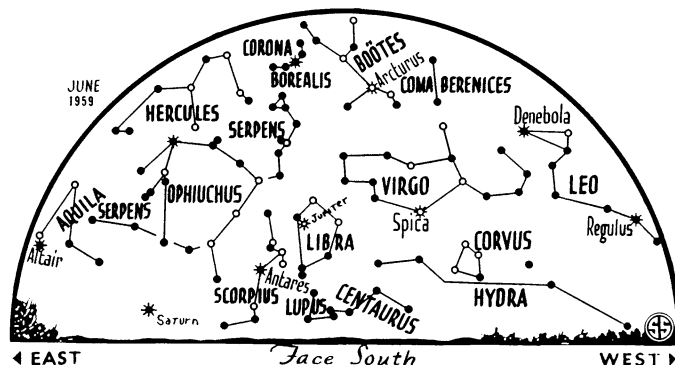
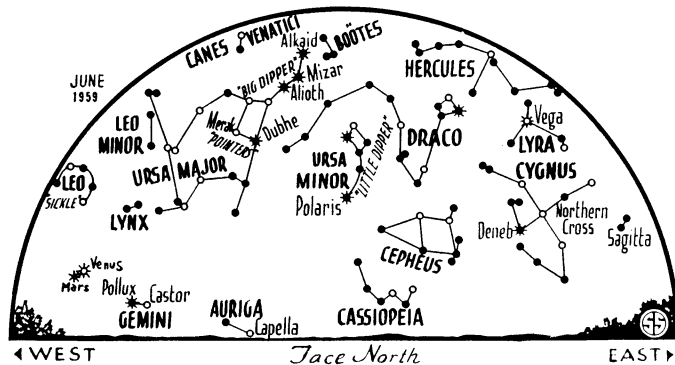
One type is called the orrery, named after a famous one that was constructed more than two hundred years ago for an Irish nobleman, the Earl of Orrery. A more modern one is displayed in New York City at the Hayden Planetarium, with balls representing the planets revolving on tracks around a glowing sun.

But any such model gives the idea that the solar system is much more crowded with planets than it actually is. If you make the ball representing the sun of reasonable size, the planets are microscopic, and spread over an area too large for convenience.

## Large-Scale Orrery

Washington, D. C., might be a good place for such a model, and the dome of the Capitol might represent the sun. The outside diameter of the dome is slightly over 135 feet. Where, then, would the planets be placed, and how large would the balls representing them have to be?

For Mercury a ball about 5½ inches in diameter would be needed, and it should be placed slightly more than a mile away from the sun. This could put it inside the Department of Justice building at 9th Street and Pennsylvania Avenue. Venus, the next



\* \* o • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS



planet, would be a ball about 14 1/4 inches in diameter, and it might rest on the President's desk in the White House, about two miles from the Capitol dome. The earth? A ball about 15 inches in diameter, over in Arlington in front of the Pentagon, nearly three miles away. Mars is out in the Washington Zoological Park, about 4 1/4 miles from the sun. Its diameter: 7 3/4 inches.

The Jupiter ball is considerably larger, 13 feet 7 inches in diameter; it is located down the Potomac at Fort Belvoir, just below Mt. Vernon and somewhat more than 14 miles from the Capitol. Saturn must be placed about 26 miles away, in Annapolis. Its diameter is 11 feet, 2 inches. Uranus, about 4 feet 7 inches in diameter, is 53 miles away, in Fredericksburg, Va. Neptune is a little smaller, 4 feet, 4 inches in diameter. It is 82 1/2 miles distant, which would place it in Pennsylvania, south of Harrisburg. And Pluto, at its mean distance, is 109 miles away. This would put it, a ball 6 1/4 inches in diameter, in Chester, Pa., a little south of Philadelphia.

Finally there are the asteroids. These are a group of tiny planets, some a mile or less in diameter, that move generally in orbits between those of Mars and Jupiter. Many thousands are within reach of great telescopes. On our model these would be represented by a truck load of sand and pebbles, scattered around a circle about eight miles from the Capitol.

The total area within the circle representing Pluto's orbit would be about 37,000 square miles. With nothing in this region except the dome, the nine balls, ranging from a few inches to 14 feet in diameter, plus the sand and pebbles, you can see how empty the solar system actually is!

### Celestial Time Table for June

June	EST	
4	3:00 a.m.	Moon farthest, distance 252,500 miles.
6	6:53 a.m.	New moon.
10	9:52 a.m.	Moon passes Venus.
	1:15 p.m.	Moon passes Mars.
14	12:22 a.m.	Moon in first quarter.
	8:00 a.m.	Venus passes Mars.
18	6:02 a.m.	Moon passes Jupiter.
19	8:00 a.m.	Moon nearest, distance 223,500 miles.
20	3:00 p.m.	Full moon.
	11:51 p.m.	Moon passes Saturn.
21	10:50 p.m.	Sun farthest north, beginning of summer.
23	3:00 a.m.	Venus farthest east of sun.
25	10:00 p.m.	Saturn nearest, distance 840,700,000 miles.

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

Science News Letter, May 23, 1959

## Do You Know

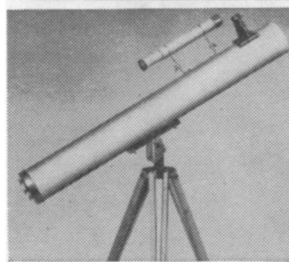
The U. S. death rate from the four principal communicable diseases of childhood, measles, scarlet fever, whooping cough and diphtheria, under age 20 fell from 143.0 per 100,000 in 1910 to 1.5 in 1956, or 99%.

The U. S. alone receives each year approximately 1,500 times its total present energy demand in the form of sunlight.

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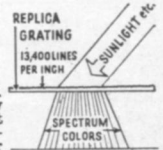
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