



# Venus moves toward Jupiter

by James Stokley

Shining low in the western sky soon after sunset in August are the two brightest planets: Venus and Jupiter. Venus, lower, sets about two hours after the sun. Jupiter, an eighth as bright, follows about an hour later. Moving eastward, Venus is drawing closer to Jupiter and will pass it on Sept. 14.

The accompanying maps show the principal stars and planets of an August evening. They appear this way at about 11:00 p.m., local daylight saving time on Aug. 1; an hour earlier in the middle of the month and two hours earlier at the end.

Vega, overhead in the constellation of Lyra, is the brightest star now visible. It is about a fortieth as bright as Venus. To the east of Lyra stands Cygnus. Deneb, the principal star, is about a third as bright as Vega. Below Lyra, toward the southeast, is Aquila with Altair. This star is between Deneb and Vega in brilliance.

Near the southern horizon shines Scorpius with Antares, dimmed somewhat because of its low altitude. This causes increased absorption of light by the earth's atmosphere. To the left of Scorpius is Sagittarius with no bright star.

**Arcturus**, almost as bright as Vega, is in the west, in Boötes. And just below the eastern end of this group stands Ursa Major. The Big Dipper is a part of it. Farther to the right is Ursa Minor, with Polaris, the pole star. (The two Pointers, in the bowl of the Big Dipper, show its direction.)

Hercules is just to the west of Lyra. In the south, just below Hercules and

above Scorpius, is Ophiuchus, a large constellation of fainter stars.

As for the other planets that may be visible to the naked eye, Mercury will be near the western horizon, lower than Venus, in mid-August. It will then set about an hour after the sun, before the sky is dark enough for the planet to be visible. A few hours later, however, you can see Saturn, which rises about midnight in Aries. Mars, which passes behind the sun on Aug. 2, won't be visible this month.

On Aug. 16 the moon will be in the opposite direction from the sun. In the full phase, its entire sunlit half will be turned earthward.

The earth's shadow extends in this same direction, but usually, when the moon is full, it passes north or south

of the shadow. But not on the 16th. A part of the moon will enter the shadow, and this will be a partial lunar eclipse. People in all of North America except the extreme northwestern part, and also in South America, will be able to see it.

The moon, which moves eastward across the sky, will make first contact with the edge of the shadow at 10:17 p.m., EDT (subtract one hour for CDT, two hours for MDT and three hours for PDT). This will be at the moon's edge, to the east of the northernmost point.

**The shadow** will cover more and more of the northern part of the moon until maximum eclipse, at 11:23 p.m. EDT. It will then extend about three-quarters of the way to the center of the lunar disk. The moon will then move out of the shadow until last contact at 12:30 a.m., on the 17th.

Two weeks after the lunar eclipse, when the moon has completed half of its monthly journey around the earth, it will move in front of the sun. This solar eclipse won't be visible from North or South America. It can be seen from the South Pacific, New Guinea, eastern Australia and the Pacific coast of Antarctica.

All of this area will see a partial eclipse—the moon hiding a part of the sun's disk. Along a belt extending eastward from New Guinea and then southeasterly toward Cape Horn, the moon will pass directly in front of the sun. But even here there won't be a total eclipse. The moon will be far enough away from earth that it will appear a little smaller than the sun. Thus a ring of the solar disk will remain visible around the dark moon. As the Latin for ring is "annulus," this is called an annular eclipse.

Annular eclipses are about as frequent as those that are total. During the 20th century there are 71 total eclipses of the sun, 68 annular and 7 that are annular at the ends of the paths and total in the middles. □

CELESTIAL TIMETABLE		
Aug.	EDT	
2	1:58 a.m.	New moon
	8:00 a.m.	Mars behind sun
3	6:00 p.m.	Moon farthest, distance 252,500 miles
	7:00 p.m.	Moon south of Regulus
6	6:00 a.m.	Moon passes south of Venus
8	10:00 p.m.	Moon passes south of Jupiter
10	4:50 a.m.	Moon in first quarter
11	9:00 p.m.	Moon passes south of Antares
12	early a.m.	Meteors visible, radiating from constellation Perseus
16	11:15 p.m.	Full moon, partial eclipse of moon
17	3:00 a.m.	Moon nearest, distance 221,900 miles
23	6:00 a.m.	Moon passes north of Saturn
	4:34 p.m.	Moon in last quarter
30	9:00 p.m.	Moon farthest, distance 252,500 miles
31	1:00 a.m.	Venus passes north of Spica
	6:01 p.m.	New moon, annular eclipse of sun not visible in North or South America