

ASTRONOMY

Venus, Mars, Saturn Now Seen

Mars, distinguished by its red color, will exceed Saturn in brilliancy by more than three times as it approaches the earth. Venus is brightest planet.

By JAMES STOKLEY

► THREE bright planets can be seen in January evenings, two of which are shown on the accompanying maps. These give the appearance of the heavens around 10 o'clock at the beginning of January and an hour earlier in the middle. Toward the east, in the constellation of Leo the lion, are shown Saturn and Mars. Mars, the lower, which is distinguished by its red color, is about one and a third times as bright as Saturn. Until mid-February, Mars will approach the earth and get still brighter, until in brilliance it exceeds Saturn by more than three times.

Our third planet is Venus, which sets about two hours after the sun, toward the southwest, and so is gone by the times for which the maps are prepared. It is many times brighter than either Mars or Jupiter, so there is little doubt about which it is. Venus, in fact, appears long before any other star or planet. Its magnitude, minus 3.4 on the astronomer's scale in the first part of January, makes it some 20 times as bright as Mars.

Jupiter Now a Morning Star

As for the other planets, Jupiter is now a morning star, in the constellation of Ophiuchus, the serpent bearer. It rises about two hours before the sun. Mercury is too close to the sun's direction during most of the month to be seen at all, but toward the end of January it will be swinging eastward from the sun, so that in early February it may be glimpsed low in the west just after sunset.

As always in this time of mid-winter, the brightest stars to be seen in the evening are those in the south around the familiar figure of Orion, which can easily be identified with the aid of the three stars in a row that form the belt of the celestial warrior.

Above the belt is first magnitude Betelgeuse, and below is Rigel. Directly below this star, supposed to mark one of the warrior's feet, is an inconspicuous

constellation called Lepus, the hare, but next to it, toward the left, we find Canis Major, the great dog. This contains the brightest star of the night-time sky—Sirius, the dog star. This is not as bright as Venus, but that body, of course, is a planet, a member of the same family as the earth, including the dark bodies that revolve around the sun and are visible only by the sunlight they reflect to us. Sirius and the other stars are themselves suns, glowing globes of gas shining with their own luminosity.

Lesser Dog Constellation

Above Sirius, and a little farther east (left) is another dog, Canis Minor, the lesser dog, in which the star Procyon shines. Above this group we come to Gemini, the twins, with Castor and Pollux. Directly south as shown on the map of the southern skies, and opposite to Orion from Sirius, is Taurus, the bull, containing the star Aldebaran, red in color, and marking the bull's eye.

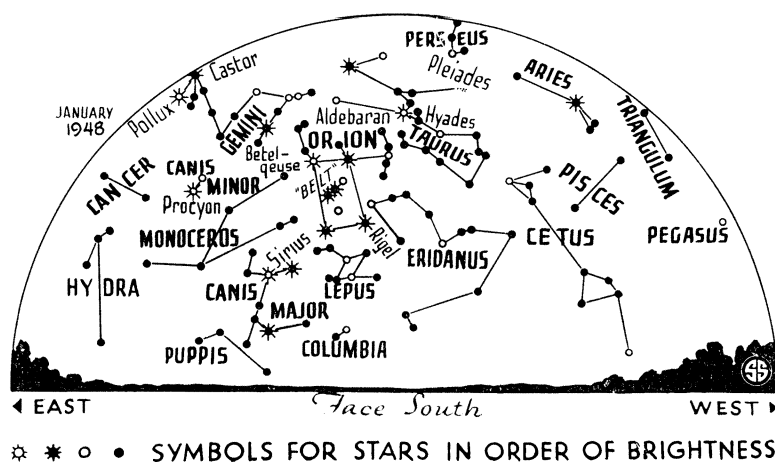
Nearly overhead we see Capella, in Auriga, the charioteer. As we descend toward the northern horizon we come to the pole star, in Ursa Minor, the lesser bear. Around this we find the familiar constellations of the northern sky that never go below the horizon, Draco, the dragon; Ursa Major, the great bear (of which the great dipper is part); Cassiopeia, the queen, and her husband, Cepheus.

Low in the east is Leo the Lion, of which the first magnitude star Regulus is a member, though it is now too low to be seen in its full brilliance. And also this group is the temporary home of Saturn and Mars.

Since the moon and planets all move through the same part of the sky, each month the moon passes each of the planets. Thus, on the evening of Jan. 13, at 11:25 p.m. (EST), it passes Venus, well to the south. On the evening of the 26th (at 11:39 p.m., EST) it passes Saturn, an even greater distance to the north. Early the next morning (12:34 a.m., EST) it passes Mars, but this time much more closely. In fact, people in the northern part of the United States and eastern Canada will be able to see an occultation, in which the moon actually hides the planet for a time. This is the first of a series of such occultations of Mars in 1948, some of which will be much better than the one this January. That coming on the evening of Sept. 6, for example, will be seen all over the United States.

Mars Coming Near Earth

This is not the only interesting thing about Mars during 1948. It is going to come closer than it has for several years. On Jan. 1 it will be some 83,356,000 miles from the earth, but it is drawing closer and closer. In the middle of February, it will be directly opposite the sun, and then Mars and the earth will be only 63,019,000 miles apart. This may not seem a short distance, but for Mars it is a fairly close approach, although at rare intervals it can come to within



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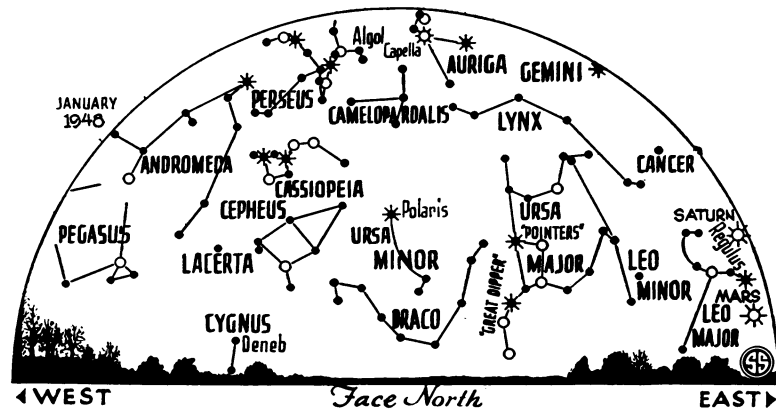
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about 35,000,000 miles. Thus the red planet will be unusually bright, and astronomers who make a specialty of planetary observations will have their telescopes trained on it steadily.

Other events on the list for 1948 include three eclipses, but none of them are particularly exciting to the astronomers. The first comes on April 23, when the moon is partially eclipsed as it enters partly into the shadow of the earth. This will not be visible at all in the United States, but may be observed from Asia, the Indian Ocean, the Pacific Ocean and Antarctica.

Second Eclipse of Year

Two weeks later, on May 8 and 9 (since it occurs on both sides of the International Date Line) the year's second eclipse occurs—one of the sun. Though the moon will come squarely between sun and earth, the moon's distance will be rather greater than average and so its apparent diameter in the sky will not be as great as that of the sun. Hence, the sun will not be completely covered. Even where the eclipse can be seen best, a ring of solar surface will remain visible around the dark disk of the moon. Such an eclipse is called "annular," from the Latin word for a ring. This will be seen along a path over the Indian Ocean, Siam, Indo-China, the China Sea, Japan and the Pacific Ocean. A larger area around the path will see the sun partially eclipsed by the moon.

On Nov. 1 comes the third eclipse of the year, a total one of the sun. But the region where it is visible is along a path over Africa, the Indian Ocean and the waters south of Australia, an inaccessible region to which few if any astronomers will go for the purpose of making observations.

The new year will also bring a comet that is visible to the naked eye. Bester's comet, discovered by a South African

astronomer of that name in September, 1947, according to early calculations, may reach a magnitude of about 2.5 at the end of February. This is well above the 6th magnitude usually taken as that of the faintest star visible to the unaided eye.

Diffuse Patch of Light

However, the comet is a diffuse patch of light and not nearly as easily located as a star of the same brilliance. Furthermore, when it is brightest, it will be too nearly in the direction of the sun to be located. Around the middle of March it will travel across the northern sky, passing near the star Altair, in Aquila, the eagle, and then near Vega, in Lyra, the lyre. These constellations, at that time of year, will be visible in the east in the early morning hours, and by then the comet will be considerably fainter. Thus, it seems most unlikely that Bester's comet will rival Halley's and other famous naked-eye comets of the past.

Time Table for January

Jan.	EST	
2	1:00 a. m.	Sun nearest earth; 91,446,000 miles
3	6:13 a. m.	Moon in last quarter
	8:00 a. m.	Mercury beyond sun
8	8:56 a. m.	Moon passes Jupiter
11	2:44 a. m.	New moon
13	1:00 a. m.	Moon farthest; 252,570 miles
	11:25 p. m.	Moon passes Venus
19	6:32 a. m.	Moon in first quarter
26	2:11 a. m.	Full moon
	6:00 a. m.	Moon nearest; 221,490 miles
	11:39 p. m.	Moon passes Saturn
28	12:34 a. m.	Moon passes Mars

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

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One job of the astronomer is to study the atmospheres of the other planets to determine their chemical composition and extent.

A record parachute drop was made when one carrying scientific instruments was released from a rocket at an elevation of 59 miles.