ASTRONOMY

Venus Shines Brilliantly

Venus, the most prominent object in the January sky, glows brightly in the southwest outshining all other planets and stars and is easily identified.

By JAMES STOKLEY

➤ ALTHOUGH it is not quite in a position to be shown on our maps, the planet Venus is now the most prominent star or planet in the evening sky. It sets about three hours after the sun.

Before that it shines in the southwest—so brightly that you will have no trouble locating it. Venus appears some time before the sky is dark, well ahead of any other object (except the moon, which passes Venus on Dec. 17).

Jupiter is also visible, higher and farther south, in the constellation of Pisces, the fishes. This planet does appear on the map. It is only about a quarter as bright as Venus, but is still very brilliant.

Three Other Planets Visible

Two other planets are in the evening sky after sunset, but are much harder to see. These are Mars, which sets very soon after the sun, and Saturn, which follows a little later. Mercury will be to the west of the sun at the end of December. Around Jan. 26 you may be able to see it low in the east just before sunrise.

But now let us go from the planets to the stars of the January evenings. These are shown on our maps, which depict their appearance about 10:00 p.m. on the first, 9:00 p.m. on the 15th and 8:00 p.m. on the 31st, your own kind of standard time.

Toward the southeast is the group of prominent constellations that make the winter evening skies so brilliant. Perhaps the most conspicuous is Orion, the warrior. Betelgeuse is the brightest star in Orion; below it is the row of three stars supposed to form his belt. First magnitude Rigel is still lower, and a little to the right.

Above and to the right of Orion is Taurus, the bull. Reddish Aldebaran marks the animal's eyes. To the left is Gemini, the twins, with the stars Castor and Pollux.

A little lower is Canis Minor, the little dog, with the star called Procyon. Still lower, and to the right, you come to the great dog, Canis Major. In this group stands Sirius, the dog-star, which is the brightest of all the stars seen in the nighttime sky. This is mainly because it is quite close to us. Sirius is about 21 times as bright as the sun, but many stars are far more luminous. Rigel, for example, exceeds the sun by some 50,000 times!

Two other stars, of first magnitude when they are high in the sky, are shown on the maps. One is so low in the northwest—Deneb, in Cygnus, the swan—that its light is greatly reduced by atmospheric absorption. Earlier in the evening it is well up in the west, at the top of the "northern cross."

In the east Leo, the lion, is coming into view, and here we find the star called Regulus, also so low that its brightness is much dimmed.

On Jan. 14 there will be an eclipse of the sun, but the only people who will be able to see it easily will be the members of the various scientific parties in the Antarctic. The region over which it will be visible covers Antarctica, the southern tip of South America and just barely reaches Tasmania.

This is not a total eclipse of the sun, like the one that occurred last July and was visible in the United States. It will be partial, and where the eclipse is greatest, on the coast of Enderby Land, only about 56% of the solar diameter will be covered by the dark disc of the moon.

It will be the first of six eclipses that will occur during 1964. Four of these will be eclipses of the sun—all partial. After January the next comes on June 10, when residents of Australia and New Zealand will see it. This time about 75% of the sun's diameter will be hidden where the eclipse is greatest.

The next, on July 9, will be visible over the Arctic regions, including parts of northern Canada, Greenland and Siberia. Then the maximum eclipse will only be about 32%. The next occurs on Dec. 3 and 4. It will be visible over northeastern Siberia, Alaska and the northern Pacific Ocean. The reason that two dates are given is because it is visible on both sides of the International Date Line. Again the maximum eclipse will be about 75%.

The two eclipses of the moon, both total as that body moves into the earth's shadow, occur on the nights of June 24 and Dec. 19. The end of the first will be visible over most of North America, while the second will be seen in its entirety from this part of the world.

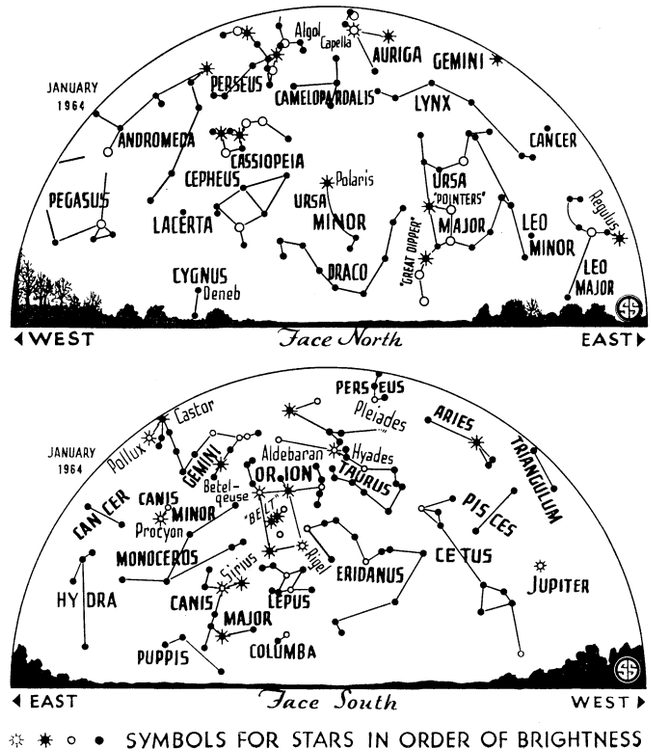
Number of Eclipses Varies

Six is an unusually large number of eclipses for one year. The most common number is four, and there can be as few as two. In that case, both will be of the sun.

But there can be as many as seven in one year—either five of the sun and two of the moon, or four of the sun and three of the moon. This will almost occur during 1964, since there was an eclipse of the moon on Dec. 30. Thus, in the 12 months between Christmas in 1963 and 1964 there are seven eclipses.

The last time there were seven eclipses in a calendar year was in 1935, with five of the sun and two of the moon. It will happen again in 1982, when solar eclipses will come on Jan. 25, June 21, July 20 and Dec. 15, and those of the moon on Jan. 9, July 6 and Dec. 30.

This information about future eclipses, by the way, comes from a very remarkable book: The Canon of Eclipses, which was published in 1887, the work of a Viennese



☼ ✷ ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

astronomer, Theodor Ritter von Oppolzer. It contains tables giving data about all eclipses (8,000 solar and 5,200 lunar) occurring between Nov. 10, 1207 B.C. (Julian Calendar) and Nov. 17, 2161 A.D. (Gregorian Calendar). There are also 160 maps, showing the approximate paths over which all the total eclipses of the sun were or will be visible. The original Vienna edition of Oppolzer's Canon is now very rare, but in 1962 Dover Publications, Inc., issued a new edition, with an English translation of the German text.

Celestial Time Table for January

(From 1964 Observer's Handbook of the Royal Astronomical Society of Canada)

JAN.	EST	
1	2:00 a.m.	Algol (variable star in Perseus) at minimum brightness
2		Earth nearest sun, distance 91,345,000 miles
3	10:50 p.m.	Algol at minimum
4	9:00 a.m.	Mercury between earth and sun
6	10:58 a.m.	Moon in last quarter
	7:40 p.m.	Algol at minimum
9	4:30 p.m.	Algol at minimum
	5:00 p.m.	Venus passes Saturn
	7:00 p.m.	Moon farthest from earth, distance 251,900 miles
14	3:44 p.m.	New moon (partial eclipse of sun visible from Antarctica)
16	8:00 p.m.	Moon passes Saturn
17	noon	Moon passes Venus
20	2:00 p.m.	Moon passes Jupiter
22	12:29 a.m.	Moon in first quarter
24	12:40 a.m.	Algol at minimum
25	8:00 p.m.	Moon nearest, distance 227,200 miles
26	7:00 p.m.	Mercury farthest west of sun (low in east before sunrise for a few days)
	9:30 p.m.	Algol at minimum
28	6:23 p.m.	Full moon
29	6:20 p.m.	Algol at minimum

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

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ASTRONOMY

Strong X-Ray Source Found in Milky Way

➤ THE MILKY WAY GALAXY in which the sun, earth and other planets are located contains a strong X-ray source near the constellation of Scorpius, the scorpion, scientists have confirmed by rocket observations.

The source can be "seen" only by instruments flown above the earth's obscuring atmosphere. This has now been done in rockets and is planned for an Orbiting Solar Observatory scheduled to be lofted into orbit in 1965.

The observations were made last June with an Aerobee rocket launched from White Sands, N. Mex., and hurled to a height of 140 miles. They showed the X-ray source in the same part of the sky in which it had been seen for the first time a year before. Geiger counters were used to detect the X-rays.

The scientists who confirmed the existence of the source, Drs. Herbert Gursky, Riccardo Giacconi and Frank Paolini of American Science and Engineering, Inc., Cambridge, Mass., and Dr. Bruno Rossi of Massachusetts Institute of Technology, Cambridge, reported their study in Physical Review Letters, Dec. 15, 1963.

• Science News Letter, 84:407 Dec. 28, 1963

GENERAL SCIENCE

Recipients of National Medal of Science Named

➤ PRESIDENT LYNDON B. JOHNSON announced five scientists as the 1963 recipients of the National Medal of Science.

Those honored and their citations are:

Dr. Luis Walter Alvarez, professor of physics and associate director of the Lawrence Radiation Laboratory, for "inspiring leadership in experimental high energy physics, continuing development of the bubble chamber, discovery of many states of elementary particles, and contributions to national defense."

Dr. Vannevar Bush, well-known engineer-scientist-administrator, for "distinguished achievements in electrical engineering, in the technology of computing machines, in the effective coupling of the physical and life sciences; and in mobilizing science, engineering and education in enduring ways in the service of the Nation."

Dr. John Robinson Pierce, executive director, research-communications principles and communications systems divisions, Bell Telephone Laboratories, for "outstanding contributions to communications theory, electron optics and travelling wave tubes, and for the analysis leading to world-wide radio communications using artificial earth satellites."

Dr. Cornelius Bernardus van Niel, Hopkins Marine Station of Stanford University, for "fundamental investigations of the comparative biochemistry of microorganisms, for studies of the basic mechanisms of photosynthesis, and for excellence as a teacher of many scientists."

Dr. Norbert Wiener, professor emeritus of the department of mathematics, Massachusetts Institute of Technology, for "marvellously versatile contributions, profoundly original, ranging within pure and applied mathematics, and penetrating boldly into the engineering and biological sciences." Dr. Wiener was the developer of the comprehensive notion of cybernetics.

The National Medal of Science was established by the 86th Congress to be awarded by the President to individuals "who in his judgment are deserving of special recognition by reason of their outstanding contributions to knowledge in the physical, biological, mathematical or engineering sciences." The awards are made on the basis of recommendations received from the President's Committee on the National Medal of Science.

The awards will be presented by the President at a ceremony in January.

• Science News Letter, 84:407 Dec. 28, 1963

Do You Know?

Nitrates, chemicals sometimes found in cattle fodder, interfere with the animal's conversion and utilization of vitamin A.

Gout, an inflammation of the joints, is found more frequently in business executives than in any other group.

Telephone conversations have been held over a distance of 7,700 miles using the U. S. Syncom II communications satellite.

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