ASTRONOMY

Saturn Shines All Night

This is the only planet seen in February evenings. Sirius, the dog-star in the constellation of Canis Major, is the most brilliant star to be seen.

By JAMES STOKLEY

➤ TO THE normally fine display of bright stars in the February evening sky we have added in this month the planet Saturn, famous for its rings, which require a telescope to see. On the 21st Saturn is in opposition with the sun, which means that it is directly opposite that body. Thus it rises in the east as the sun sets in the west, and is visible throughout the night.

The accompanying maps show how the sky appears about 10:00 o'clock on Feb. 1, and an hour earlier at the middle of the month. At such times Saturn appears to the east, in the constellation of Leo, the lion, which is about halfway from the horizon to the zenith. Saturn is just below the hook-shaped group of stars in this figure called the sickle, and of which the star Regulus marks the end of the handle. Regulus is of magnitude 1.3 on the astronomer's scale. It is considerably fainter than Saturn which is now of magnitude 0.4, making it about 2.3 times as bright.

Most brilliant star to be seen, however, is shown directly south. This is Sirius, the dog-star, in the constellation of Canis Major, the greater dog. Its magnitude is minus 1.58, which makes it about 6.3 times the brightness of Saturn.

Orion, the Warrior

Above and to the right of Sirius we see Orion, the warrior, one of the finest of constellations. Above the three stars in a row representing his belt is the bright star Betelgeuse, while below is Rigel, with about the same magnitude as that of Saturn. Above Sirius is Canis Minor, the lesser dog, with Procyon as the brightest star. Still higher, indeed nearly overhead, are Gemini, the twins, with first magnitude Pollux. Almost directly overhead, as shown on the maps, is Capella, in Auriga, the charioteer.

High in the southwest, to the right of Orion, Taurus, the bull, may be seen. In this group is a V-shaped group of stars, called the Hyades, which mark the animal's face, and the star in the upper part of the left-hand arm of the V is the brilliant and ruddy Aldebaran, which marks his eye. Farther to the right, in the bull's shoulder, is another famous small group of stars known as the Pleiades, but these contain no bright object.

Even if you wait up all night in February, you may not easily be able to see more than two other planets. One is Jupiter, now in the constellation of Sagittarius, the archer, which comes up in the southeast nearly two hours ahead of the sun. On Feb. 28 Mercury will be farthest west of the sun, but it will be so low in the southeast that it will be hard to find. Venus is in the same part of the sky, in the constellation first of Sagittarius and then of Capricornus, and is so brilliant, even exceeding Sirius, that it should be located low in the east at dawn. Mars is so close to the sun that it can hardly be seen at all in February.

Great Nebula

Extending southward from the star called Alnilam, which is the one in Orion's belt nearest to Sirius, are some fainter stars that form the warrior's sword. One of these stars, particularly if you look at it through binoculars, seems to have a rather hazy appearance. Through a big observatory telescope it is seen to be a luminous cloud of light, known as the great nebula in Orion.

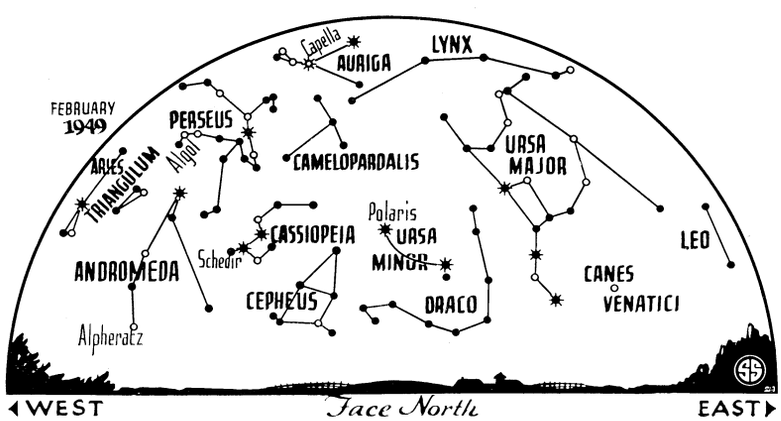
It is rather curious that Galileo, who in 1610 was the first astronomer to study the heavens through a telescope, failed to observe this nebula. He did make a careful examination of Orion, and left us in one of his works a star chart of the constellation showing many stars too faint to be seen with the naked eye which he saw for the first time. This chart, however, shows no indication of the nebula. Perhaps the images shown by his primitive instrument were all so fuzzy that he did not notice anything very different about the stars at the heart of the nebula, so the actual discovery was left for one of his admirers, Peiresc, of Provence, who discovered it in December, 1610.

Later, many other nebulae were discovered and in 1781 the French astronomer Messier made a catalog of 103 such objects. He was interested not in the nebulae themselves, but in comets, and often had picked up a supposed new one to find that it was just a nebula. Therefore he made a catalog of the latter so that he could easily check them. The one in Orion is number 42 in his list, so now that object is often referred to as M.42. Other nebulae, too, are frequently designated by such a "Messier number," even though to that gentleman they were probably merely a nuisance that interfered with his real interest.

During the 18th and 19th centuries, the English astronomers, father and son, Sir William Herschel and Sir John Herschel, made a much more complete catalog. However, at that time their true nature was unknown. Some of Messier's nebulae were shown by Herschel's telescopes to be clusters of stars, and it seemed reasonable to suppose that the others were similarly constituted, but needed superior telescopes to resolve them.

100-Inch Telescope

This turned out to be true for some, particularly those which have a spiral structure, but it took the 100-inch telescope at the Mt. Wilson Observatory, largest in the world until the recent completion of the 200-inch at Mt. Palomar, to reveal their constituent stars. An explanation of the nature of some of the others was obtained in the 60's with the newly invented spectroscope, which analyzes the light from the celestial bodies. A star such as the sun, it was found, gives a spectrum consisting of a continuous band of color, crossed by dark lines. In 1864, Sir William Huggins examined spectroscopically a bright little nebula in the northern sky, and found that its spectrum was just one bright green line. Since then other lines have been found, but they are all bright, against a dark background, and the spectrum of the Orion nebula has a similar appearance. A bright-line spectrum is characteristic of a glowing gas, so the nature of these nebulae became immediately ap-



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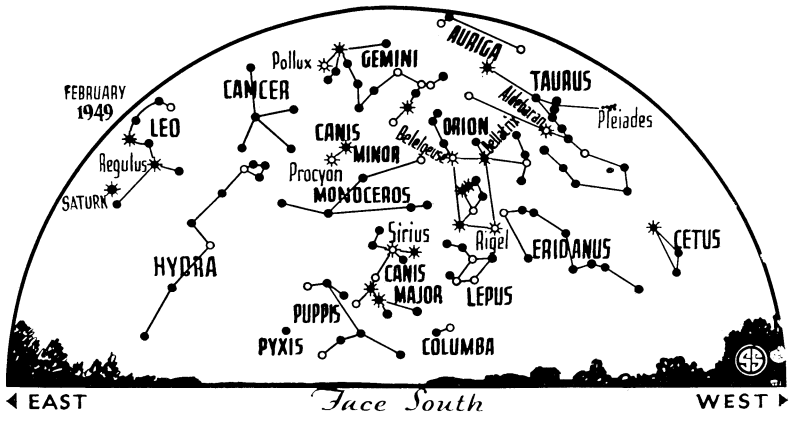

parent and we now call them gaseous nebulae.

This did not, however, explain the source of energy which keeps such a nebula glowing, but now it is believed that the process is the same as that which takes place in a fluorescent light. In one of these lamps an electrical discharge passing through mercury vapor causes it to give off some blue light, and a great deal of ultraviolet radiation, which is similar to light, but consists of waves too short to affect the eye. The tube is lined with a fluorescent material called a phosphor. When ultraviolet rays hit atoms in the phosphor some of the electrons are knocked out of their usual orbit in which they revolve about the atomic nucleus. Soon, however, they fall back into place and when they do they give off visible light. Most of the gaseous nebulae have very hot stars at their center which are giving off much ultraviolet, and these rays similarly knock electrons out of the atoms of the nebulae. Falling back, they give off light, some of which eventually reaches us.

Time Table for February

Feb.	EST	
1	9:00 p. m.	Moon farthest, distance 252,000 miles
2	1:00 p. m.	Mercury between earth and sun
6	3:05 a. m.	Moon in first quarter
10	2:00 a. m.	Mercury passes Venus
13	4:08 a. m.	Full moon
	5:01 p. m.	Moon passes Saturn
14	5:00 a. m.	Moon nearest, distance 222,800 miles
19	7:43 p. m.	Moon in last quarter
21	1:00 p. m.	Sun and Saturn in opposite parts of sky
23	5:54 p. m.	Moon passes Jupiter
25	2:21 a. m.	Moon passes Mercury
26	10:02 a. m.	Moon passes Venus
27	3:55 p. m.	New moon
	9:42 p. m.	Moon passes Mars
	Midnight	Mercury fathest west of sun

Subtract one hour for CT, two hours for MT, and three for PT.

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Louis, Mo., Charlotte, N. C., Detroit and Lansing, Mich., Yakima, Wash., Great Falls, Mont., Columbus, Ohio, and St. Paul, Minn. Arrangements have already been completed for opening of centers at Portland, Ore., Boise, Ida., Philadelphia, Pa., Nashville, Tenn., and Louisville, Ky.

More than 110,000 pints of blood have been collected and the program has served more than 700 hospitals and 33 clinics. The Red Cross makes no charge for the blood or its derivatives available through the program. Physicians and hospitals, however, may charge for administration of the blood and for any other services undertaken to safeguard the patient.

"The program has been increasingly successful in meeting calls for blood," Basil O'Connor, president of the American Red Cross, said. "This has been due not only to the generosity of the American people but to the cooperation of physicians, hospitals, and health departments. But the program has still a long way to go before it reaches truly national proportions."

Science News Letter, January 22, 1949

CHEMISTRY

Dr. Lewis Honored by Institute of Chemists

➤ DR. WARREN K. LEWIS, emeritus professor of chemical engineering at the Massachusetts Institute of Technology, will be awarded the 1949 gold medal of the American Institute of Chemists at the Institute's annual meeting in Chicago in May.

Dr. Lewis, who is noted for research in petroleum and leather chemistry, will be honored for his administrative ability, leadership and outstanding success as a teacher.

Science News Letter, January 22, 1949

MEDICINE

New Uses of Blood Ahead

➤ ON Jan. 12 the National Blood Program of the American Red Cross went into its second year of operation.

As the benefits of the first year of this activity are recounted, prospects of further disease-fighting uses of blood appear in medical research reports. For the future there is the possibility of using fractions of blood against scarlet fever, mumps, and jaundice as some blood fractions are now being used to check measles.

Most important use for blood remains the saving of lives of persons who have lost large amounts through injury or disease. But during the war, while the Red Cross was collecting blood for this use by the armed forces, a method of dividing blood into various fractions, each of them potentially useful, was discovered. Aim of the National Blood Program now is to collect, process and distribute enough blood and blood fractions to supply all the blood needs of the nation in peace as well as in war or other national disaster.

Blood for this program is being collected, processed and distributed through a series of regional centers. To date 18 of these centers have been opened, in addition to a state-wide mobile unit service in Massachusetts. Some centers have only gone into operation within the past month. Longest in operation is the one in Rochester, N. Y., which opened just a year ago, on Jan. 12, 1948.

By the end of the present fiscal year, June 30, 1949, more than 30 centers are expected to be in operation. Those now in operation for one or more months, in addition to Rochester, are: Wichita, Kans., Tucson, Ariz., Stockton, San Jose and Los Angeles, Calif., Atlanta, Ga., Washington, D. C., Omaha, Nebr., Springfield and St.

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