ASTRONOMY

Jupiter Is Closest in May

Except the moon, Jupiter is the brightest object in the May sky. May will bring a solar eclipse, most important astronomical event of the year.

By JAMES STOKLEY

➤ AS IF to call attention to the reappearance in the evening skies of a characteristic constellation of summer, one of the brightest planets is now visible nearby. Look to the southwest on May evenings and the most conspicuous object (except the moon) that can be seen is Jupiter. Standing in the constellation of Libra, the scales, its place is shown on the accompanying maps, depicting the skies at 10:00 p.m., your own kind of standard time (or 11:00 p.m. daylight saving time) on the first of the month; an hour earlier about May 15, and two hours earlier on the 31st. Just below Jupiter, Scorpius, the scorpion, is beginning to appear, with Antares, red in color, just getting above the horizon. Later in the evening than the times given it rises higher and the rest of the scorpion is in view.

Jupiter Opposite Sun

On the 14th of May Jupiter is in opposition—that is, it is directly opposite the sun, which means that it rises at sunset and is in the sky all night. Also, it means that the planet is closest to the earth (only 407,300,000 miles) which is responsible for its being so bright. Incidentally, on May 5 the moon, a day after it is full, passes very close to Jupiter, just to the south. They are closest at 7:09 p.m. EST, which will be before it gets dark over most of the country.

Another planet can also be seen. This is Saturn, which stands in the west in the constellation of Cancer, the crab. In astronomical magnitude it is 0.5, considerably fainter than the minus 2.1 of Jupiter, but still equal to a typical star of the first magnitude.

Speaking of stars, the brightest now seen is Vega, in Lyra, the lyre, over to the northeast. Just below this figure is Cygnus, the swan, with Deneb, also of the first magnitude, though in the position shown it looks fainter because it is so near the horizon. In the southwest, to the left of Cancer, is Leo, the lion, with the star Regulus. And next to Leo, continuing to the left, is Virgo, the virgin, with Spica. Above the eastern part of Virgo is Bootes, the bear driver, in which Arcturus shines.

Canis Minor in West

Low in the west, below Cancer, is Canis Minor, the lesser dog, with Procyon. To the right of the dog we see Gemini, the twins, with Castor and Pollux, the latter of magnitude one. Low in the northwest in Auriga, the charioteer, is Capella, a star that shone directly overhead on winter evenings, and now is about to leave our view for a while.

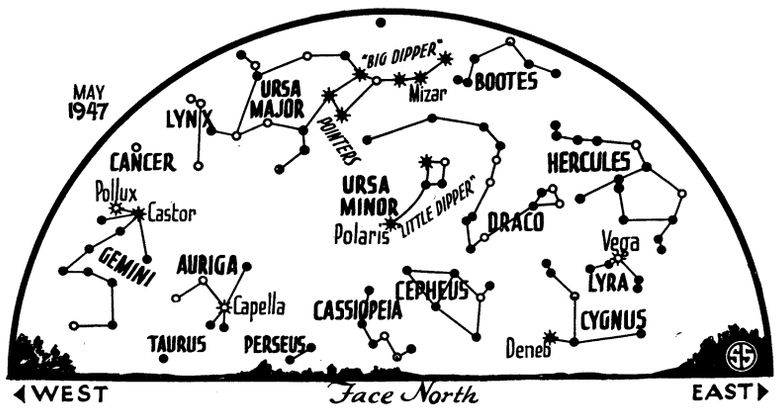
As for the other planets, Mercury is not to be seen at all in May, but Venus, of magnitude minus 3.3, more brilliant even than Jupiter, comes up in the east just before sunrise. Mars is in the same part of the sky, though far fainter, with magnitude 1.5. At the beginning of May, Venus rises first. However, the two planets pass on May 17, and after that Mars is the first to appear. On the morning of May 18, the moon, a narrow crescent two days before it is new, passes Mars and Venus, so the three bodies in the sky will make an interesting spectacle.

The most important astronomical event of the month—indeed of the year—takes place on May 20 when the shadow of the moon sweeps across the earth for the first time since July, 1945, causing a total eclipse of the sun. That one occurred during wartime. It was quite short, and early in the morning in the parts of the United States and Canada where it was visible. Though the May 20 eclipse is not visible at all in North America or Europe, it provides a much better opportunity for astronomers to make the observations that are possible only when the moon hides the sun, and so many parties are traveling to the places in South America and Africa where it can be seen. Not all of these are astronomers, for such an eclipse gives physicists an unusual opportunity to study problems of the transmission of radio waves. As the moon cuts off ultraviolet radiation from the sun the ionosphere—the radio "roof" high in the atmosphere that keeps all except the shortest of radio waves from leaving the earth and shooting into outer space—is quickly affected. Thus radio transmissions from and across the path of the shadow will be made and measured.

Moon's Shadow

At 7:09 a.m., EST, on May 20 the moon's shadow will touch earth at a spot in the Pacific Ocean several hundred miles off the coast of southern Chile. Thence it moves northeastward, tracing out of the path of totality, about 100 miles wide, in which the sun will be completely hidden. As it sweeps across Chile, it goes to the south of Valparaiso, but includes Santiago, where the total phase occurs just after sunrise. It then moves across central Argentina, Paraguay and Brazil, reaching the Atlantic coast at Bahia at 7:45 a.m., EST (though by local standard time it will be 9:45 a.m.).

Going to sea, the shadow quickly crosses the Atlantic, reaching the coast of Liberia, in Africa, about 9:25 a.m., EST, which will be 12:25 p.m. there. It goes along the Gold and Ivory Coasts,



and heads inland, due east, and then a little southeast. The shadow leaves the earth from a spot in Tanganyika at 10:25 a.m., EST, but there it will be at sunset. Over a much larger area than this narrow path, including all of Africa, much of the South Atlantic and most of South America, there will be a partial eclipse, with the dark disk of the moon hiding more of the sun the nearer one is to the path of totality.

Long Eclipse

One of the most attractive features of this eclipse, to astronomers, is its relatively long duration. While the sun can be totally eclipsed for as long as 7½ minutes, it is rarely that one lasts more than a couple of minutes. In the middle of the Atlantic Ocean this eclipse will last for 5 minutes 14 seconds, but as it is hard to make entirely satisfactory observations from a ship this will not be of so much value. In Liberia, however, the duration will be but a few seconds less than five minutes. Along the coast of Brazil it will last about four minutes which is still quite good.

Many expeditions of astronomers have gone from observatories in the United States, Canada and various European countries to favored locations in Brazil and Africa. Photographs will be made with cameras large and small. Some will be made through spectroscopes, to analyze the light of the eclipse. Thus we will gain added knowledge of the sun, particularly of its mysterious corona, the outermost layer. Until a few years ago it was visible only at eclipse time, but there are new techniques by which the brightest parts may be observed at other times. Still, however, to see it in its entirety an eclipse is needed and that is one of the main reasons that makes astronomers travel thousands of miles, gambling with possible cloudy weather, to be there when the moon hides the sun.

Celestial Time Table for May

May	EST	
4	11:53 p.m.	Full moon
5	7:09 p.m.	Moon passes close to Jupiter
10	2:00 a.m.	Moon farthest, distance 251,600 miles
13	3:08 a.m.	Moon in last quarter
14	3:00 a.m.	Jupiter opposite sun and nearest, distance 407,300,000 miles
17	7:00 a.m.	Venus passes Mars
18	3:46 a.m.	Moon passes Mars
	4:30 a.m.	Moon passes Venus
20	8:44 a.m.	New moon; total eclipse of sun visible in South America and Africa
22	2:00 a.m.	Moon nearest, distance 224,600 miles
24	5:38 p.m.	Moon passes Saturn
26	11:35 p.m.	Moon in first quarter

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

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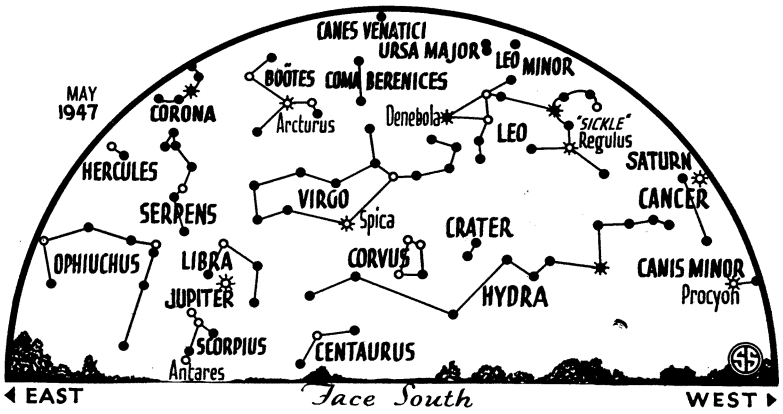

☼ ✱ ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

MINING

Demonstration of Mine Explosions Are Made

➤ THE DEMONSTRATION of coal-mine explosions and preventive measures, being given in Bruceton, Pa., by the U. S. Bureau of Mines on Saturday, April 26, is part of an educational program of the government office discontinued during the war but revived a year ago.

The recent Centralia disaster, and the following explosion with several fatalities at Exeter in Pennsylvania, are evidences of the need of such a program. In an industry where explosive gases and organic dusts collect in the air in underground chambers, and in which explosives are necessarily used to loosen seams of coal, every worker concerned, from boss to helper boy, needs instruction in the danger and how they are best lessened.

While this demonstration is open to the public, the program is primarily for mine supervisory officials, foremen and operators. It is being given at the Bureau's experimental mine, with man-made explosions of methane gas and of coal dust. Methods of extinguishing fires, and the testing of safe and unsafe explosives for blasting purposes, will be demonstrated.

For the coal-dust explosion, 700 pounds of the finely pulverized material will be spread in the mine entrance and ignited by a stick of dynamite. Dynamite is not an explosive that may be used in coal mining under the government's safety code, but it is still used in some mines.

The Bureau has tested many explosives used in mining and has designated some that will not cause dust explosions when used. These are designated as "permissible explosives." The demonstration will show how permissible explosives will not ignite a cloud of dust, as well as the danger of using a nonpermissible.

The Bureau's experimental mine is reported to be the only one of its kind in the world. It was opened in 1911, and the principal work undertaken in connection with it has been the development of ways to prevent gas and dust explosions. Rock-dusting, coating the walls and ceilings of coal mines with pulverized limestone, or other noncombustible material, is one of its great achievements.

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CHEMISTRY

Rubberlike Compound Can Be Used as Insulation

➤ A SYNTHETIC rubberlike insulating compound invented by a German, Willi Mertens of Berlin, is the subject of patent 2,418,978, vested in the Attorney General. It is a mixture of polyisobutylene, styrene and paradivinylbenzol, heated until it has become soft and rubbery.

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