ASTRONOMY

Scorpion Shines in South

Four planets, Saturn, Jupiter, Mars and Venus, appear in the skies and a partial eclipse of the sun will be visible in the polar region during the month of July.

By JAMES STOKLEY

➤ ALONG WITH OTHER constellations characteristic of the summer evening Scorpius, the scorpion, now comes into view in the southern sky. And after a few weeks when the evening skies were devoid of prominent planets, Saturn appears, farther east.

On the accompanying maps you see the appearance of the heavens for about 11:00 p.m., your own kind of daylight saving time, on July 1, and an hour earlier at the middle of the month.

You can easily recognize Scorpius by the red star Antares, which is supposed to mark its heart. From it, downward to the left, curls a hook-shaped line of stars that forms the tail. Just to the right stands the less conspicuous group of Libra, the scales.

Farther right and a little higher is Virgo, the virgin, with bright Spica. Above Virgo shines the brilliant star, Arcturus, in Bootes, the herdsman. To the left of Scorpius is Sagittarius, the archer.

Although Ophiuchus does not have any stars of the first magnitude, the constellation, directly above Scorpius, is quite prominent. On the old star maps, which pictured the figures around the stars, this represented a man holding a snake, which is the constellation of Serpens, part to the right, the other to the left of the serpent-bearer.

Saturn Low in Southeast

Low in the southeast, at the times for which the maps are prepared, is the planet Saturn. It is greatly dimmed because its light has to pass through a great thickness of the earth's atmosphere. But later in the night, it will be higher and farther south.

Higher in the southeast shines bright Altair, in Aquila, the eagle. Above it, on the southern map, is a single faint star, labeled "Cygnus." The main part of this constellation, which pictures a swan, is to the left, and shown on the northern sky map. In it is the bright star Deneb. Still higher is the bright star Vega, in Lyra, the lyre.

To the northwest is the familiar great dipper, with Benetnasch, Mizar and Alioth forming the handle, from which it hangs. In the bowl, at the lower end, are Dubhe and Merak, the pointers. A line through them, to the right, leads to Polaris, the pole star, which always shines in the north, practically above the north pole of earth. The Great Dipper is actually part of the great bear, Ursa Major, while Polaris is in Ursa Minor, the little bear. And above this group winds the snake-like figure of Draco, the dragon.

Three other planets can be seen later in the July night. Jupiter rises in the east about 1:00 a.m., daylight time. It is many times brighter than Saturn, or any star. Approximately two hours before the sunrise Mars comes up in the northeast, now quite faint, because it is at the relatively great distance of 208 million miles. About an hour ahead of the sun, after the sky has started to brighten, Venus appears. This month it is at maximum brightness—more than eight times as bright as Jupiter. It is so brilliant that you can see it for a short time even after the sun has risen.

An eclipse of the sun occurs on July 9, visible in northeastern Siberia, the polar region, northern Alaska, and parts of the Canadian provinces of Alberta, Saskatchewan and Manitoba, as well as the Yukon and Northwest Territories. But even where the greatest eclipse is seen—near the Bering Strait—only about a third of the sun's diameter will be hidden. That is, it will be a partial eclipse and not total, like the one that was seen in Canada last summer.

In ancient times people thought that the stars were points of light attached to a huge sphere that surrounded the earth, and revolved around it every day. And even today astronomers sometimes refer to the "celestial sphere," as if all the stars were at the same distance, even though they know very well that some are relatively close and others are exceedingly far away.

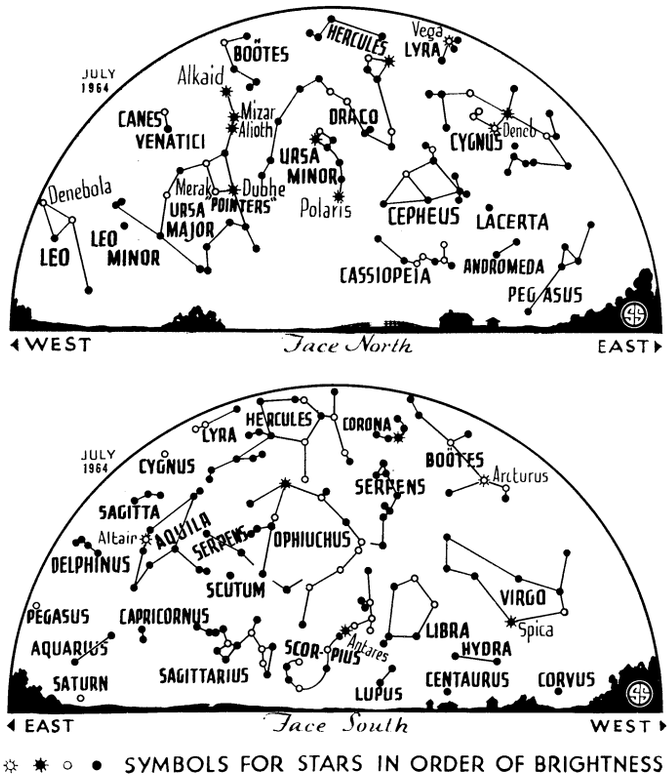
Thus, two stars which seem to be almost together may actually be very far from each other. They may happen to be almost in the same direction. Our familiar constellation figures look as they do only from our direction. Seen from a planet revolving about some other star they would seem to be arranged very differently.

Take, for example, the Great Dipper, now so prominent in the northwest. It consists of seven stars: Dubhe and Merak are the pointers, then Phecda, Megrez, Alioth, Mizar and Benetnasch (at the end of the handle).

Measuring Star Distance

Astronomers have measured the distances of these stars, like many others, by their parallax. This is the shift they seem to make in the sky as viewed six months apart, when the earth is first on one side of the sun, then on the opposite side. The earth is 93 million miles from the sun, so this is a change in viewpoint of 186 million miles, the diameter of the earth's orbit. The greater the parallax, the nearer is the star.

Of the stars in the dipper, the nearest is Alioth, the star in the dipper's handle nearest the bowl. And the farthest Benetnasch, at the end of the handle. As a unit of distance the astronomer uses the light year, which is about six million million miles. This is the distance that a beam of light, with a speed of 186,000 miles per



☼ ✸ ○ ● SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

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second, travels in one year. Alioth is 49 light years away, while Benetnasch is nearly four times as far, at a distance of 192 light years! For the other stars the distances are:

Mizar	78 light years
Alioth	49 light years
Phecda	88 light years
Merak	76 light years
Dubhe	105 light years

As we look at these stars we look back into time. For example, the light from Benetnasch when you look at it tonight left on its long journey in 1859, the year in which John Brown, with 21 men, seized Harper's Ferry. Alioth we see as it was at about the time the 16th Amendment, empowering Congress to levy and collect income taxes, was proclaimed in effect on Feb. 16.

Other stars are still farther away, and the time their light left goes still farther back, even before men first appeared on earth, or even before the earth or the sun was born.

Celestial Time Table for July

JULY	EDT	
2	4:31 p.m.	Moon in last quarter
5		Earth farthest from sun, distance 94,456,000 miles
	8:00 a.m.	Moon passes Jupiter
7	2:00 a.m.	Moon passes Mars
8	7:00 a.m.	Moon nearest, distance 223,100 miles
9	7:31 a.m.	New moon, partial eclipse of sun
16	7:48 a.m.	Moon in first quarter
18	3:00 a.m.	Venus passes Mars
20	5:00 p.m.	Moon farthest, distance 251,900 miles
24	11:58 a.m.	Full moon
26	noon	Venus at greatest brilliancy
	11:00 p.m.	Moon passes Saturn
31	11:30 p.m.	Moon in last quarter

Subtract one hour for CDT, two hours for MDT, and three hours for PDT.

• Science News Letter, 85:406 June 27, 1964

ASTRONOMY

Bright Comet Discovered In Northeastern Sky

➤ A NEW COMET, bright enough to be seen by the naked eye when far away from city lights, has been discovered independently by three astronomers, one in Argentina, the other two in Japan.

However, only real comet buffs or late-show viewers will be likely to see it, even under the best of conditions, since it does not rise above the horizon in Washington until nearly three a.m. Then it will be very low in the northeast sky, rising higher in the east as morning progresses, but morning twilight could interfere with spotting it.

The comet, rated as magnitude six, was discovered by the astronomer Gerber of Argentina's National Observatory, Cordoba, on June 8 and also on June 8 by the Japanese astronomer, Nimoto Honda. It was discovered earlier independently on June 6 by the Japanese astronomer Tomita.

Its position, on June 9, was right ascension two hours, 16.8 minutes; declination, 12 degrees, six minutes.

Comet Tomita-Gerber-Honda is diffuse but has a central condensation. It is moving northeastward, according to Harvard College Observatory, Cambridge, Mass.

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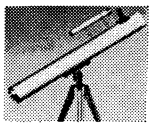

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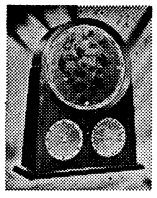

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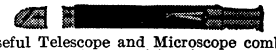

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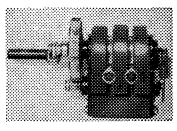

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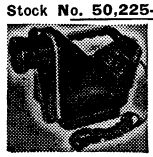

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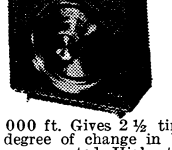

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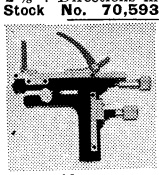

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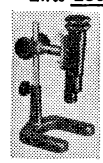

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