

## ASTRONOMY

# Saturn Is Still Visible

Since Saturn is only planet to be seen in the evenings, July is a good month to become acquainted with constellations typical of a summer sky.

By JAMES STOKLEY

➤ WITH SATURN the only planet visible these July evenings, and that rather low in the southwest, we still have a good opportunity to get acquainted with the stars that are typical of a summer evening.

These are shown in the accompanying maps, as they appear about ten o'clock (your own kind of standard time) and an hour earlier in the middle of July. Add one hour if you are on daylight time.

Perhaps the most characteristic of these star groups is Scorpius, the scorpion, which is directly south and not far above the horizon. In it is the red star, Antares. To the left of the curved row of stars that form the scorpion's tail is Sagittarius, the archer, which has the outline of a teapot!

Just to the right of the scorpion is Libra, the scales, in which there are no very bright stars. Farther to the right is Virgo, the virgin.

This is the constellation in which Saturn shines, just above Spica, the brightest star in the group. The planet is slightly brighter, and its steady light makes it easy to distinguish from the twinkling glow of the star.

## Brightest July Star

Most brilliant star of the July evening, however, is to be found high in the east, in Lyra, the lyre. This is Vega, about 2.75 times as bright as Spica, and it looks even more than that. Because it is so much higher, its light suffers less absorption passing through the atmosphere.

Vega is at the top of a triangle of bright stars which can easily be located. Below and farther north is Deneb, in Cygnus, the swan. In the southeast, almost as high, we find Altair, in Aquila, the eagle. This star may be recognized because of the fainter stars nearby, one just above, the other below.

Just to the right of Aquila are the constellations of Ophiuchus, the serpent-bearer, and Serpens, the serpent he is carrying. Between them, they cover a large area of the sky, although they contain no stars of the first magnitude.

The figure of Serpens is in two parts—one on each side of Ophiuchus. It is the only constellation so divided.

Looking toward the northwest we now find the great dipper coming into a good position. This figure is part of Ursa Major, the great bear. At the bottom of the dipper, which now hangs with the bowl downwards, are the pointers whose direction, fol-

lowed to the right, brings us to Polaris, the pole star. This is Ursa Minor, the little bear, and at the end of the handle of the little dipper.

Following toward the south the curve of the three stars, Alioth, Mizar and Alkaid, which form the handle of the large dipper, we come to the sixth and the last of the first-magnitude stars now visible. This is Arcturus, in Bootes, the bear-driver.

If the curve of the handle is followed still farther south, it leads toward Spica and Saturn.

## Other Planets Visible

Two other planets can be seen late these nights, rising in the east about three hours ahead of the sun, both in the constellation of Taurus, the bull. The brighter of the pair is Venus.

The other is Jupiter, which is shining more brilliantly than any of the other planets or stars. On July 22 Venus passes Jupiter, traveling toward the east.

Both Mercury and Mars are invisible in July because they are almost in the direction of the sun. On the 25th Mercury comes nearly in front of the sun, and on July 8 Mars is directly behind it.

Compared to Orion, which shines so brilliantly high in the winter evening sky, Scorpius, which is now seen low in the south, is considerably less conspicuous. But this is largely on account of its far southerly position, so that in July we see it as high as it ever gets, in our lifetime at least.

Anyone who has been fortunate enough to view it from the southern hemisphere and see it up near the zenith, has quite a different idea of this fine group of stars.

Scorpius is the southernmost of the 12 constellations of the zodiac, the path of the

sun through the year, as well as of the moon and planets. The sun passes through the scorpion early in December. On Dec. 21, the day of the winter solstice, marking the beginning of winter, it stands just to the north of the upper of the two easternmost stars of Sagittarius, that is the spout of the teapot.

The star Antares received that name, which means "rival of Mars," because of its red color, much like that of the planet Mars. Its distance is such that its light, traveling at the speed of 186,000 miles per second, takes 172 years to reach us. Thus, we say, its distance is 172 light years.

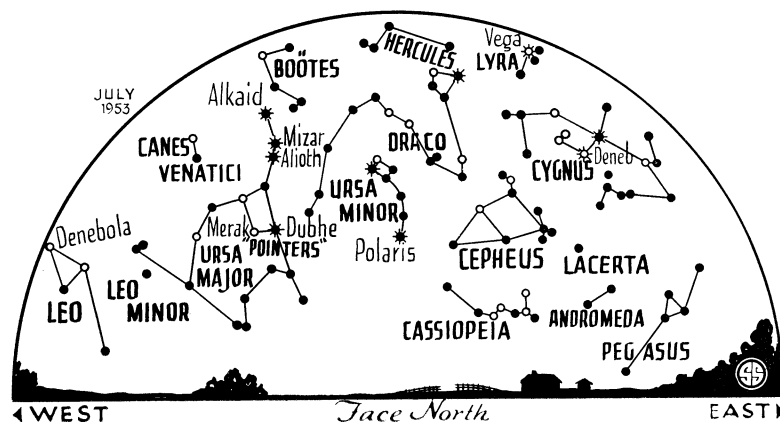
The constellation of Libra, the scales, next to the right and also one of the zodiacal constellations, is associated with Scorpius and, in fact, was once part of it. "Libra" means the scales, yet the Arabic names of the two brightest stars, Zubeneschamali and Zubenelgenubi, mean respectively the "northern claw" and the "southern claw."

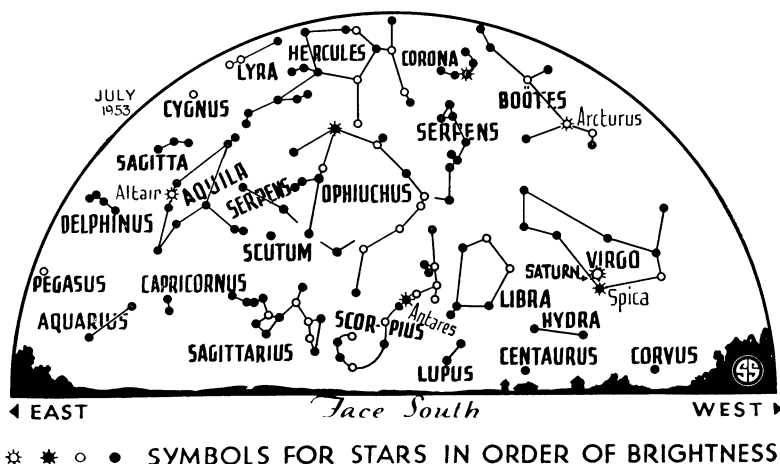
Thinking of these as part of a pair of scales, it is hard to understand the significance of these designations. However, when we realize that once the claws of the scorpion extended up into this part of the sky, they become more appropriate.

## Two July Eclipses

The month of July brings two eclipses, though it is very unlikely that many of our readers will see the first one. This happens on the night of July 10. The dark inner core of the moon's shadow, inside which the sun would be completely hidden, fails to reach the earth at all.

However, over a large area around the North Pole and the Arctic regions, including northwestern Canada, eastern Alaska and northern Greenland, the outer part of the shadow will extend, and there a partial eclipse of the sun will be observed. At its maximum only about a fifth of the solar diameter will be covered, so it will not be of any great scientific interest.





The month's second eclipse is a total one of the moon, which occurs when that body enters the shadow of the earth on July 26. At 5:32 a.m. EST, the moon begins to enter the shaded region, and that, of course, will be after the moon has set and the sun has risen in the eastern part of the nation. In the Midwest, especially the more westerly parts, it should be possible to see the partially eclipsed moon low in the west shortly before dawn.

Still farther west, in the Rocky Mountain states, it may even be possible to see it totally eclipsed. The mid-eclipse occurs at 7:21 a.m. EST, which is 4:21 Pacific Standard time.

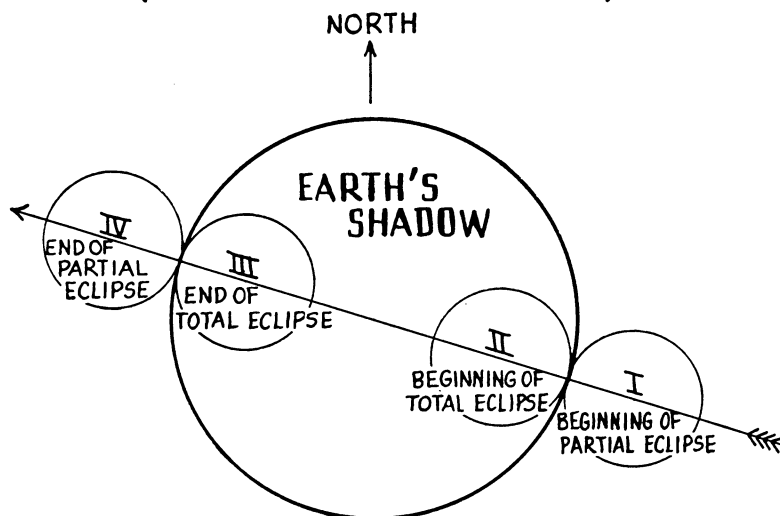
At San Francisco, sunrise occurs that day about 5:00 a.m. PST, so along the Pacific

Coast the beginning, at least, of the total phase should be easily visible, provided one happens to be up at that early hour!

### Celestial Time Table for July

July	EST	
3	5:03 p.m.	Moon in last quarter.
5	1:00 p.m.	Earth farthest from sun, distance 94,450,000 miles.
7	7:44 a.m.	Moon passes Venus.
8	6:15 a.m.	Moon passes Jupiter.
10	9:28 p.m.	New moon, partial eclipse of sun visible in Arctic regions.
16	10:00 a.m.	Moon farthest, distance 251,600 miles.
18	7:43 p.m.	Moon passes Saturn.
	11:47 p.m.	Moon in first quarter.
22	5:00 p.m.	Venus passes Jupiter.
26	7:20 a.m.	Full moon, total eclipse of moon visible from western U. S.

### TOTAL ECLIPSE OF MOON, JULY 26, 1953 (PARTLY VISIBLE IN WESTERN U.S.)



The large circle represents the shadow of the earth, and the small circles, I, II, III and IV, indicate the successive positions of the moon as it passes through the shadow. North is toward the top. Phases III and IV are not visible in the far western states. The four phases shown occur at the following times:

I	4:32 a.m. CST	3:32 a.m. MST	2:32 a.m. PST
II	5:30	4:30	3:30
III	7:11	6:11	5:11
IV	8:09	7:09	6:09

28 9:00 a.m. Moon nearest, distance 225,200 miles.

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

Science News Letter, June 27, 1953

### TECHNOLOGY

## "Water Wings" Lift Small Boats From Water

See Front Cover

► THE SMALL boat skipping across the cover of this week's SCIENCE NEWS LETTER is one of the Navy's experiments with hydrofoils. Currently under test at the Naval Air Station, Patuxent River, Md., hydrofoils are wing-like structures that act in water similar to the way airplane wings act in air.

Although they produce considerable drag at slow speeds, "water wings" can actually lift boats from the water, sharply reducing overall resistance. This permits boats to travel faster than they could with their hulls plowing through the water.

Science News Letter, June 27, 1953

### ELECTRONICS

## Radio Circuits Built in Tiny, Replaceable Units

► RADIO, TV and other electronic sets of the future can be built of small, replaceable and standardized units assembled without soldering. Parts of circuits would be replaced like tubes.

The National Bureau of Standards is investigating a novel method of cellular electronic construction proposed by Dr. P. J. Selgin of its engineering electronic laboratory. The new method makes full use of printed electronic circuits, also a Bureau of Standards development.

Individual molded cells of plastic, less than an inch on all sides, contain one or two circuit elements, such as resistors, capacitors and inductors. Each of these cells has three contacts, one on the top and two on the bottom. These press against the printed or etched circuits that replace conventional wires. The springs that keep the units in place are extensions of the tube socket contacts.

Twelve cells of this sort are assembled in a block along with two electron tubes. Electronic mechanisms are assembled from such blocks. When trouble occurs in any place, the offending cell is simply replaced by a spare and the repair is made.

The Navy Bureau of Aeronautics is supporting the development to improve construction and maintenance of electronic equipment. Printed circuits got their start in the research that gave our armed forces the proximity fuse, which bursts a shell when it comes near a plane or other target even if it does not hit it. The proximity fuse was also a Bureau of Standards development.

Science News Letter, June 27, 1953