

## ASTRONOMY

# Brilliant Sky Seen in July

An unusually brilliant display of stars and planets will be seen in the southern sky during July. Jupiter will be the brightest object, with the exception of the moon.

By JAMES STOKLEY

► TWO BRIGHT PLANETS, Jupiter and Saturn, have joined with the stars of the summer evening to make an unusually brilliant display in the southern sky.

These are shown on the accompanying star maps, which show how the sky looks at about 10:00 p.m., your own kind of standard time (add one hour for daylight saving time) at the first of July, and an hour earlier in the middle of the month.

The most brilliant evening object, with the exception of the moon, is Jupiter, seen in the southwest close to the star Spica which is part of the constellation of Virgo, the virgin. Spica is about a tenth as bright as Jupiter.

Farther left, in the south, you can see Saturn, which is about a sixth as bright as Jupiter. This planet is in Ophiuchus, the serpent-bearer, just above Scorpius, the scorpion. The brightest star in the latter group is Antares, which is distinctly red in color.

## Vega: Brightest Star

The brightest star now visible surpasses Saturn, but not Jupiter. This is high in the east and is shown on the map of the northern half of the sky. It is Vega, in Lyra, the lyre. Just below is Cygnus, the swan, with bright Deneb; and to the right of this figure stands Aquila, the eagle, with Altair.

High in the southwest, above Virgo, you can find Bootes, the bear-driver, in which stand Arcturus. These six stars, Vega, Arcturus, Altair, Spica, Antares and Deneb, are all of the first magnitude, in the astronomical scale of brilliance.

Among stars that are somewhat fainter, although they are familiar, are those of Sagittarius, the archer, seen in the south just to the left of Scorpius. This figure resembles a teapot, with the spout to the right, close to the curved row of stars that form the scorpion's tail.

The big dipper, mainly of stars of the second magnitude, hangs in the northwest, part of Ursa Major, the great bear. The handle points upwards; at the bottom are the "pointers."

By following their line to the right, you can locate Polaris, the polestar, which is in Ursa Minor, the lesser bear. Farther right, near Cygnus, is Cepheus, a mythological king, and below is Cassiopeia, the queen, marked by a group of stars forming the letter W.

Another interesting although fainter constellation is shown directly overhead. This is Hercules, named after the strong man of mythical lore. Six of the stars of this group, in the western part of the constellation, outline the very inappropriate figure of a but-

terfly. The body runs east and west, with one wing to the north and the other to the south.

During July two other planets appear later at night.

Around midnight Mars rises, in Pisces, the fishes, and can be recognized by its red color, as well as its brilliance. Mars is steadily approaching the earth, for a relatively close visit of 45,000,000 miles in November. On July 16 it will be at the same distance as the sun, a little more than 94,000,000 miles away.

## Venus Is Early Riser

Venus, even brighter than Jupiter, appears in the northeast about two hours before sunrise. And about July 26 Mercury will be farthest east of the sun, remaining above the western horizon after sunset for a short time, but not long enough to be seen easily.

At this time of year, soon after the beginning of summer, it is fairly late in the evening before the sky gets really dark and the stars can be seen in their full glory. But, for the same reason, this is a good time to see the interesting but seldom noticed appearance of the earth's shadow after sunset.

It is generally known that, at an eclipse of the moon, the edge of our planetary shadow appears on the lunar surface. Less well-known is the fact that every clear evening you can see the shadow in the earth's atmosphere.

After the sun has set, look in the opposite direction, which is to the southeast at this time of year. At about the time of sunset, all that you notice is a pinkish glow, very low in the sky. But shortly, underneath the pink, there is a dark band, which gradually enlarges, as its upper edges climbs higher. This is actually the shadow of the earth. Above it, the sunlight is shining on the atmospheric haze in the east, making it brighter; so below, where the earth shades

it, it looks darker. This effect appears mainly in the troposphere, up to a height of about five miles, where there is some dust, and not in the stratosphere, at higher levels.

Although this shadow gradually climbs to the zenith, and then descends in the west, it becomes less and less distinct. But then there is a second shadow in the east which repeats the phenomenon of the first. The light rays that produce this are not coming directly from the sun. They result from the sunlight that is reflected from the higher parts of the atmosphere, beyond the western horizon, on which the sun is still shining.

Looking to the western sky in the early morning, before sunrise, you may see a similar effect in reverse, with the shadows starting high and descending to the horizon, finally disappearing completely as the sun rises in the east.

There are some other interesting appearances in the sky at sunset.

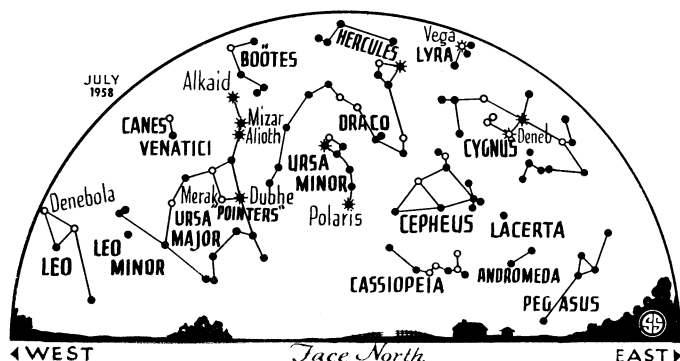
Sometimes beams of light may fan out from the sun, hidden behind clouds, or even with the clouds behind the horizon. These are the crepuscular, from "crepusculum" which is Latin for "twilight," rays. Here the clouds in front of the sun have an irregular upper edge and the rays of sunlight shine through the gaps, toward you.

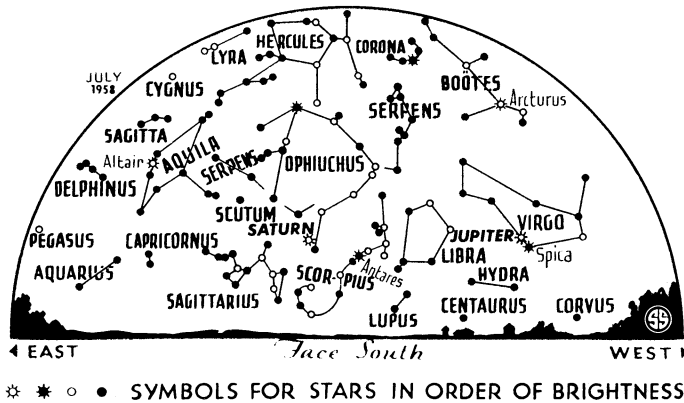
Like searchlight beams, these are visible on account of the scattering of their light by the atmosphere, while the spaces between them are dark. Because the sun is so far away, these beams are parallel, but they seem to converge, toward the sun, because of perspective, like the parallel tracks of a railroad.

## Spectrums and the "Green Flash"

And then sometimes, just as the sun disappears behind the horizon, the last bit of its upper edge that you see may turn momentarily a brilliant green. This is called the "green flash."

What happens in this case is that the long layer of atmosphere through which the sun's light has to pass, on the way to your eyes, acts as a prism and spreads the sun out into a vertical spectrum, red at the bottom, with the other colors, orange,





yellow, green, blue and violet, above. But because the sun presents the appearance of a disc, the red from one part is mixed with the green from another, and the spectrum is not a very pure one.

At the last moment, before sunset, however, when only a thin sliver of the upper part of the disc is still visible, this does not occur, and the spectrum becomes purer.

All this happens in the distance, beyond the horizon. The red, orange and yellow rays are bent downwards so much that they do not get beyond the horizon, to your eyes.

The blue and the violet rays, which would be on top, are absorbed by the great thickness of atmosphere through which they have to pass, so they do not reach you at all. Thus green is the last you see, and that causes the sun to show a green flash, just before it disappears from view.

The same thing may happen as the sun is rising, and the first bit to appear may show this green color. But the effect is not a common one; conditions have to be just right for it to appear. That is probably why, according to an old Scottish legend, the person who has seen it would never be deceived in love, for it was supposed to

give that person the magical power to look clearly into one's own heart and into the hearts of others!

**Celestial Time Table for July**

July	EST	
1	1:04 a.m.	Full moon.
5	3:00 p.m.	Earth in aphelion (farthest from sun for year)—distance 94,449,000 miles.
8	6:00 p.m.	Moon in apogee (farthest from earth for month)—distance 251,100 miles.
	7:21 p.m.	Moon in last quarter.
9	10:00 a.m.	Moon passes Mars.
14	1:21 a.m.	Moon passes Venus.
16	1:33 p.m.	New moon.
21	6:00 a.m.	Moon in perigee (nearest for month) — distance 229,100 miles.
22	10:43 p.m.	Moon passes Jupiter.
26	4:00 p.m.	Mercury farthest east of sun.
	10:23 p.m.	Moon passes Saturn.
29	early a.m.	Meteors visible radiating from constellation Aquarius.
30	11:47 a.m.	Full moon.

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

Science News Letter, June 21, 1958

**ENGINEERING**

**Noise of Heavy Trucks Reduced by Research**

➤ UNDESIRABLE NOISES made by heavy truck tires and exhausts soon may be almost eliminated.

New tire tread designs already have reduced much of the noise associated with heavy trucks, and even better designs may be expected soon from research laboratories, T. A. Roberston and J. H. Cox, Firestone Tire and Rubber Company, reported to the Society of Automotive Engineers meeting in Atlantic City, N. J.

Tires without tread produce the least noise, but they are not practical, the engineers said. Some of the new designs feature zig-zag treads, parallel grooves or uneven tread spacing.

Sound recording machines and specially developed instruments for measuring sound are playing the major laboratory roles in reducing exhaust noise, Dean G. Thomas, director of research, Nelson Muffler Corporation, reported.

Exhaust systems that are almost noiseless, but still efficient in large truck operation, will result from current research.

**Glass Engine Parts**

➤ MAJOR WORKING parts of engines and even automobile brake shoes can be made of glass, the engineers learned.

Pyroceram, the trademark for a series of glass-ceramics announced a year ago by Corning Glass Works, Corning, N. Y., was described as lighter, stronger and more heat-resistant than most metals.

Drs. W. W. Shaver and S. D. Stookey of Corning's Atomic Energy Department suggested the new glass-ceramics for use as piston heads, high-temperature bearings, brake shoes and structural parts of hypersonic aircraft.

Science News Letter, June 21, 1958

**BOTANY**

**Waxy White Flowers Form Belt on Tree Bark**

➤ BROAD, elaborately woven belts of waxy white flowers that circle the trunks of trees are just one of the plant curiosities of Barro Colorado Island in the Panama Canal Zone.

The tiny blossoms, it would take more than five lying side by side to cover an inch, are parasites found only living under the bark of living trees. They break through to the surface when they flower.

Other strange plants include one that is unique to the Island. *Aphiomeris panamensis* has no chlorophyll and has been found only three times in a half century.

There are also more than 70 species of slime molds on the Island, fungus-like growths that behave like plants and like animals at various stages in their life cycles.

Barro Colorado Island is used by the Smithsonian Institution as a jungle life preserve where native plants and animals can be studied.

Science News Letter, June 21, 1958



**BULGE IN THE SEA**—New world maps based on gravity research at Ohio State University show many irregularities in the earth's surface. Dr. Weikko A. Heiskanen, supervisor of the Air Force-sponsored project, indicates a "bulge" which the study has revealed at the western end of the Mediterranean Sea.