Two eclipses during July

by James Stokley

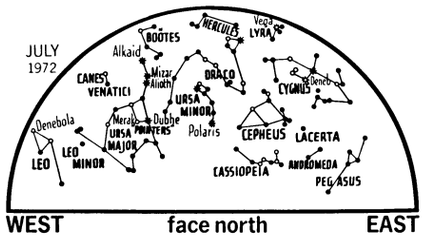
July will bring the first eclipse of the sun visible in the United States and Canada since 1970. It will be seen as a total eclipse along a path crossing northern Alaska and Canada to Nova Scotia. At sunrise on the 10th the moon's shadow will touch earth in eastern Siberia. Moving eastward it will trace out the path of totality, from which the sun will be completely hidden by the moon. It passes over northern Alaska and the Arctic coast of Canada, then turns to the southeast. After crossing Hudson Bay, Quebec, the Gaspé Peninsula, Prince Edward Island, New Brunswick and Nova Scotia, it goes to sea. The path ends as the shadow leaves earth when the sun sets at a point in the mid-Atlantic west of the Canary Islands.

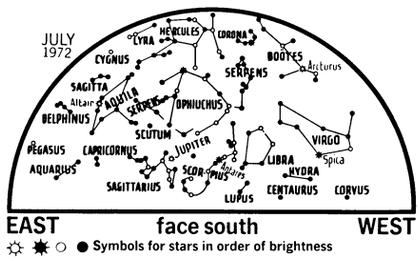
When the moon covers the solar disk at a total eclipse, the sun's outer portion, the corona, becomes visible.

A total eclipse of the sun can last about seven and a half minutes, but such duration is extremely rare. This one will be total for 2 minutes 36 seconds on the western coast of Hudson Bay. Where it crosses the St. Lawrence River this will be reduced to 2 minutes 16 seconds, and on the coast of Nova Scotia to 2 minutes 6 seconds.

Over all the continental United States and Canada, as well as eastern Mexico, there will be a partial eclipse. The nearer to the path of totality, the more of the sun will be hidden. In the eastern United States the eclipse will be at its height about 4:40 p.m. EDT; in the central states about 3:20 p.m. CDT; and along the Pacific coast about 12:30 p.m. PDT.

The second eclipse of July, during the night of the 25th-26th, will be of the moon. A partial eclipse, it will be visible generally in North America. At its height about half of the moon will be immersed in the earth's shadow. At 1:55 a.m. EDT (12:55 p.m. CDT; 11:55 p.m. MDT, 10:55 p.m. PDT) the southeastern edge of the full moon will start entering the earth's shadow. At 3:16 a.m. EDT will come the maximum eclipse: the southern half of the moon will be in shadow. It will have a coppery red color. This is caused by sunlight that has been reddened as it passes through our atmosphere and is also bent so that it falls on the eclipsed part of the moon. At 4:37 a.m. EDT the last part of the shadow will leave the southwestern edge of the moon.





Eclipses of the sun are more frequent than those of the moon, in the ratio of about three to two. A total solar eclipse is visible somewhere on earth, on an average, every year and a half. During the decade of the 70's there are 22 solar eclipses, of which 7 are total. There are 15 lunar eclipses, 9 of which are total.

A lunar eclipse is visible from more than half the earth—wherever the moon can be seen at the time. To see a total solar eclipse one must be in the path of totality, averaging about 60 or 70 miles in width. Even the accompanying partial eclipse is visible only from a relatively limited area. For any particular place a total solar eclipse will be visible once in about 360 years.

The accompanying maps show the sky as it looks about 11 p.m. local daylight saving time, on July 1. It looks the same about 10 p.m. on the 15th. □

CELESTIAL TIMETABLE

July	EDT	
3	11:25 pm	Moon in last quarter
5		Earth nearest sun, distance 94,514,000 miles
7	7:00 pm	Moon nearest earth, distance 226,950 miles
8	8:00 am	Moon passes north of Saturn
10	3:39 pm	New moon; total eclipse of sun visible in Alaska and Canada
	7:00 pm	Mercury farthest east of sun; visible for a few days around this date low in west at dusk
18	3:46 am	Moon in first quarter
19	4:00 pm	Moon farthest, distance 251,300 miles
21	7:00 pm	Moon passes Antares
23	noon	Moon passes south of Jupiter
24	5:00 am	Venus at greatest brilliancy
26	3:24 am	Full moon; partial eclipse of moon visible over North America