

Why do solar eclipses move from west to east when the Sun and Moon move from east to west?

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The reason is that the path of a solar eclipse depends only on the straight line speed of the Moon on the Earth's surface, while the path of the Moon and Sun in the sky depends on the rotation speed of the objects involved. mandarin.



Seen from the North Pole, the Earth and Moon both face east. The Moon's path through the sky is determined by the line of sight from the Earth's surface to the Moon. Because the Earth rotates once (1 day) faster than the Moon completes one revolution around the Earth (1 month), the line of sight (and the Moon) both start in the east when the moon rises later. As the Earth rotates, the Moon gradually moves overhead the observer, eventually setting in the west, even though the Moon actually moves east the entire time.

Meanwhile, the path of the Solar Eclipse is determined by the location of the Moon's shadow falling on the Earth's surface and the Moon will cast a shadow opposite the direction of the Sun.

The moon moves around the earth in an easterly direction, at a speed of more than 3,500km/h, and this celestial body's shadow moves at nearly the same speed. The earth's surface also moves eastward but much more slowly. The Earth's surface at the equator moves at a speed of about 1,600km/h. This is the speed at which the Earth rotates around its axis, and this speed slows down towards the poles. Importantly, no matter where the observer stands on Earth the lunar shadow moves much faster than the eastward motion of the Earth's surface. This means the eclipse will appear to go from west to east.

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