

### 26 dec 19 solar eclipse in ghana

An eclipse is a natural phenomenon. In some ancient and modern cultures, solar eclipses were attributed to supernatural causes or regarded as bad omens. Astronomers' predictions of eclipses began in China as early as the 4th century BC; eclipses hundreds of years into the future may now be predicted with high accuracy.

Looking directly at the Sun can lead to permanent eye damage, so special eye protection or indirect viewing techniques are used when viewing a solar eclipse. Only the total phase of a total solar eclipse is safe to view without protection. Enthusiasts known as eclipse chasers or umbraphiles travel to remote locations to see solar eclipses.

The Sun's distance from Earth is about 400 times the Moon's distance, and the Sun's diameter is about 400 times the Moon's diameter. Because these ratios are approximately the same, the Sun and the Moon as seen from Earth appear to be approximately the same size: about 0.5 degree of arc in angular measure.

Because Earth's orbit around the Sun is also elliptical, Earth's distance from the Sun similarly varies throughout the year. This affects the apparent size of the Sun in the same way, but not as much as does the Moon's varying distance from Earth. When Earth approaches its farthest distance from the Sun in early July, a total eclipse is somewhat more likely, whereas conditions favour an annular eclipse when Earth approaches its closest distance to the Sun in early January.

A total eclipse occurs on average every 18 months; when the dark silhouette of the Moon completely obscures the bright light of the Sun, allowing the much fainter solar corona to be visible. During an eclipse, totality occurs only along a narrow track on the surface of Earth. This narrow track is called the path of totality.

A hybrid eclipse (also called annular/total eclipse) shifts between a total and annular eclipse. At certain points on the surface of Earth, it appears as a total eclipse, whereas at other points it appears as annular. Hybrid eclipses are comparatively rare.

The diagrams to the right show the alignment of the Sun, Moon, and Earth during a solar eclipse. The dark gray region between the Moon and Earth is the umbra, where the Sun is completely obscured by the Moon. The small area where the umbra touches Earth's surface is where a total eclipse can be seen. The larger light gray area is the penumbra, in which a partial eclipse can be seen. An observer in the antumbra, the area of shadow beyond the umbra, will see an annular eclipse.

The Moon's orbit around Earth is inclined at an angle of just over 5 degrees to the plane of Earth's orbit around the Sun (the ecliptic). Because of this, at the time of a new moon, the Moon will usually pass to the

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north or south of the Sun. A solar eclipse can occur only when a new moon occurs close to one of the points (known as nodes) where the Moon's orbit crosses the ecliptic.

The Moon orbits Earth in approximately 27.3 days, relative to a fixed frame of reference. This is known as the sidereal month. However, during one sidereal month, Earth has revolved part way around the Sun, making the average time between one new moon and the next longer than the sidereal month: it is approximately 29.5 days. This is known as the synodic month and corresponds to what is commonly called the lunar month.

Finally, the Moon's perigee is moving forwards or precessing in its orbit and makes a complete circuit in 8.85 years. The time between one perigee and the next is slightly longer than the sidereal month and known as the anomalistic month.

During a central eclipse, the Moon's umbra (or antumbra, in the case of an annular eclipse) moves rapidly from west to east across Earth. Earth is also rotating from west to east, at about 28°km/min at the Equator, but as the Moon is moving in the same direction as Earth's rotation at about 61°km/min, the umbra almost always appears to move in a roughly west-east direction across a map of Earth at the speed of the Moon's orbital velocity minus Earth's rotational velocity.

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