



SCHEMATIC VIEW summarizing the year's eclipses. At each date of New or Full Moon, the Earth is shown with the Moon inward of it at New Moon, outward at Full. The plane of the Moon's orbit at the time is shown in blue, paler for the half lying south of the ecliptic. This plane gradually rotates backward. There is an eclipse if the Moon is Full or New when it is in the ecliptic plane, that is,

close to the time it crosses the ascending node of its orbit or the opposite descending node. The black arrow is the Moon's course over 7 days. The view is from ecliptic longitude 270°, latitude 30°. Relative to the Earth's orbit, the Sun's size is exaggerated by 15, Earth and Moon by 600, and the Earth-Moon distance by 40; the inclination of the Moon's orbit is exaggerated from 5° to 10°.

Timetables of the two eclipse seasons of 2018

All times are in Universal Time (UT).

Jan. 30 9:48—Moon at perigee.

I: Total eclipse of the Moon, January 31

Number 49 of the 73 in lunar **saros series** 124 (1152 to 2450 A.D.).

Jan. 31 10:50—(contact P1) penumbral eclipse begins: first contact of Moon with Earth's shadow.

11:48—(U1) partial eclipse begins: first contact of Moon with Earth's umbra.

12:51—(U2) total eclipse begins: Moon becomes wholly inside Earth's umbra.

13:27—Full Moon (Moon at opposition to Sun in ecliptic longitude). Moon's center is exactly south of the center of Earth's shadow, as measured perpendicularly to the ecliptic.

13:29.9—**middle of eclipse**: Moon nearest to center of Earth's shadow. The umbral magnitude of the eclipse is 1.321; that is, the umbra reaches across the Moon and another 0.321 of its diameter.

13:36—Moon at opposition to Sun in right ascension; its center is exactly south of the center of Earth's shadow, as measured perpendicularly to the equator.

14:08—(U3) total eclipse ends: Moon touches farther edge of Earth's umbra.

15:12—(U4) partial eclipse ends: last contact of Moon with Earth's umbra.

16:10—(P4) penumbral eclipse ends: last contact of Moon with Earth's shadow.

Jan. 31 18:46—Moon at ascending node.

Feb. 3 24—Middle of eclipse season: Sun at same longitude as Moon's descending node.

Feb. 11 14:17—Moon at apogee.

Feb. 14 21:12—Moon at descending node.

II: Partial eclipse of the Sun, February 15

Number 17 of the 71 in solar **saros series** 150 (1729 to 2991 A.D.).

Feb. 15 18:56—partial eclipse begins: first contact of Moon's penumbral cone with Earth, at local sunrise.

20:15—conjunction of Moon and Sun in right ascension: Moon's center exactly south of Sun's as measured perpendicularly to Earth's equator. Center of eclipse takes place at local apparent noon, with Sun and Moon on the meridian.

20:51—**greatest eclipse**: axis of shadow passes nearest ($\gamma = -1.214$ Earth-radius) south of the center of Earth. As seen from the point of greatest eclipse, the magnitude is 0.599; that is, the Moon covers this fraction of the Sun's diameter.

21:06—New Moon (conjunction of Moon with Sun in ecliptic longitude): Moon's center is exactly south of Sun's as measured perpendicularly to the ecliptic.

22:47—partial eclipse ends: last contact of penumbra with Earth, at local sunset.

Feb. 27 14:36—Moon at perigee.

III: Partial eclipse of the Sun, July 13

Number 69 of the 71 in solar **saros series** 117 (792 to 2054 A.D.).

July 13 1:48—partial eclipse begins: first contact of Moon's penumbral cone with Earth, at local sunrise.

2:48—New Moon (conjunction of Moon with Sun in ecliptic longitude): Moon's center is exactly south of Sun's as measured perpendicularly to the ecliptic.

3:01—**greatest eclipse**: axis of shadow passes nearest ($\gamma = -1.352$ Earth-radius) south of the center of Earth. As seen from the point of greatest eclipse, the magnitude is 0.337; that is, the Moon covers this fraction of the Sun's diameter.

3:09—conjunction of Moon and Sun in right ascension: Moon's center exactly south of Sun's as measured perpendicularly to Earth's equator. Center of eclipse takes place at local apparent noon, with Sun and Moon on the meridian.

4:14—partial eclipse ends: last co

July 13 8:27—Moon at perigee.

July 14 2:52—Moon at ascending node.

July 27 5:23—Moon at apogee.

IV: Total eclipse of the Moon, July 27

Number 37 of the 70 in lunar **saros series** 129 (1369 to 2613 A.D.).

July 27 17:13—(P1) penumbral eclipse begins: first contact of Moon with Earth's shadow.

18:24—(U1) partial eclipse begins: first contact of Moon with Earth's umbra.

19:30—(U2) total eclipse begins: Moon becomes wholly inside Earth's umbra.

13:27—Full Moon (Moon at opposition to Sun in ecliptic longitude). Moon's center is exactly south of the center of Earth's shadow, as measured perpendicularly to the ecliptic.

13:29.9—**middle of eclipse**: Moon nearest to center of Earth's shadow. The umbral magnitude of the eclipse is 1.321; that is, the umbra reaches across the Moon and another 0.321 of its diameter.

13:36—Moon at opposition to Sun in right ascension; its center is exactly south of the center of Earth's shadow, as measured perpendicularly to the equator.

21:14—(U3) total eclipse ends: Moon touches farther edge of Earth's umbra.

22:19—(U4) partial eclipse ends: last contact of Moon with Earth's umbra.

22:41—Moon at descending node.

23:30—(P4) penumbral eclipse ends: last contact of Moon with Earth's shadow.

July 28 23—Middle of eclipse season: Sun at same longitude as Moon's ascending node.

Aug. 10 13:42—Moon at ascending node.

Aug. 10 18:09—Moon at perigee.

V: Partial eclipse of the Sun, August 11

Number 6 of the 71 in solar **saros series** 155 (1928 to 3190 A.D.).

Aug. 11 8:02—partial eclipse begins: first contact of Moon's penumbral cone with Earth, at local sunrise.

9:20—conjunction of Moon and Sun in right ascension: Moon's center exactly north of Sun's as measured perpendicularly to Earth's equator. Center of eclipse takes place at local apparent noon, with Sun and Moon on the meridian.

9:36—**greatest eclipse**: axis of shadow passes nearest ($\gamma = 1.150$ Earth-radius) north of the center of Earth. As seen from the point of greatest eclipse, the magnitude is 0.737; that is, the Moon covers this fraction of the Sun's diameter.

9:58—New Moon (conjunction of Moon with Sun in ecliptic longitude): Moon's center is exactly north of Sun's as measured perpendicularly to the ecliptic.

11:31—partial eclipse ends: last contact of penumbra with Earth, at local sunset.

Aug. 23 11:14—Moon at apogee.

Aug. 24 4:52—Moon at descending node.

