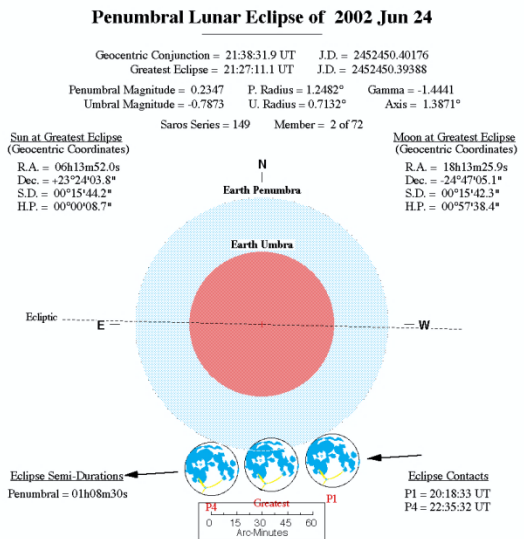
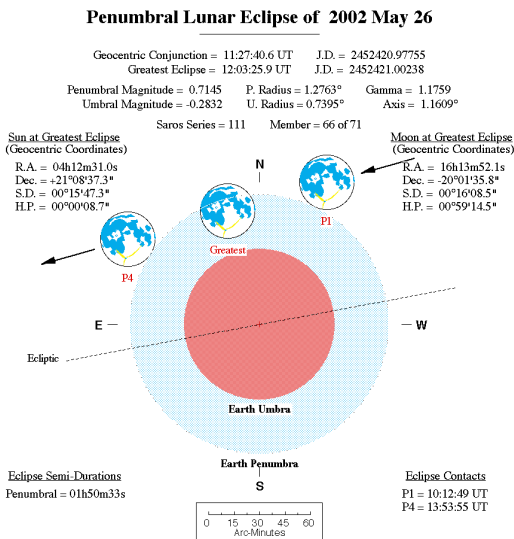
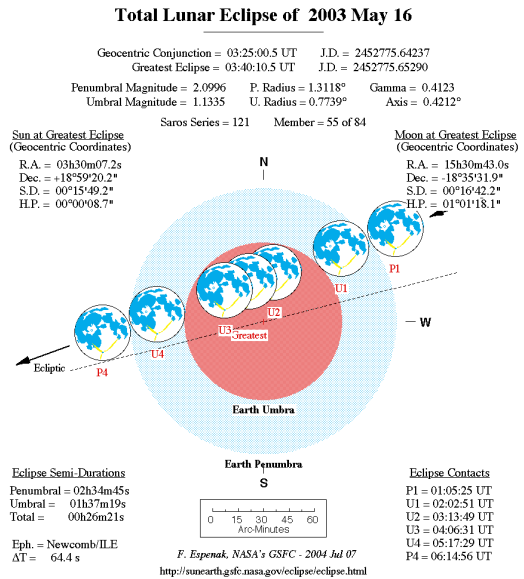


Lunar Eclipses

A total lunar eclipse occurs when the entire Moon passes through the darkest part of Earth's shadow called the umbra. This is illustrated in the diagram below of the Total Lunar Eclipse on May 16, 2003. The dark circle in the diagram is Earth's umbra shadow at the distance of the Moon's orbit.

In a partial lunar eclipse, either a part of the Moon passes through the umbra or all or part of the Moon passes through the lighter part of Earth's shadow called the penumbra (the light circle in the diagrams). The two eclipses that occurred on May 26, 2002 and June 24, 2002 (illustrated in the two diagrams below) are examples of lunar eclipses where only part of the Moon passed through the penumbra.

The dotted line in all three diagrams, labelled "Ecliptic" is a projection of Earth's orbit around the Sun into space. The arrows in all three diagrams show the direction of the Moon's motion and also show the Moon's orbit around Earth.



Is the Moon's orbit around Earth in the same plane as Earth's orbit around the Sun?
 Can you model the motion of the Moon during each of these lunar eclipses?
 While most calendar years have only two lunar eclipses, some years have three like in 2002. As there are normally twelve full moons in a calendar year, why isn't there a lunar eclipse at every full moon?
 When there is no lunar eclipse at the time of a full moon, where is the Moon in relation to Earth's shadow?
 How does the orientation/alignment of the Moon's orbit around Earth compare with Earth's orbit around the Sun?