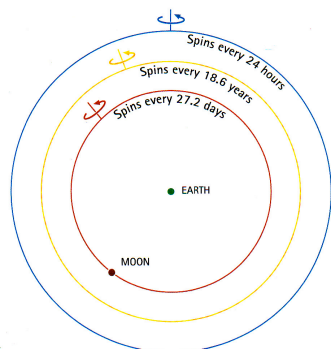


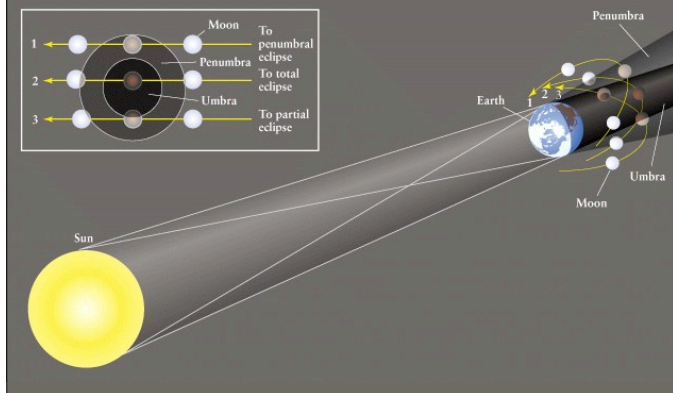
Línea de los nodos “precesa” con un período de 18.6 años, período de repetición de los eclipses Luni-Solares.



• Eudoxio incluye tres esferas para reproducir la órbita Lunar:

1. Movimiento diario
2. Regresión de los nodos
3. Período Sideral

Eclipses de Luna



Total Eclipse
left and below

When the Earth (c), Moon (a) and the Sun (A) move into a direct line, with the Moon in the mid-position, the Moon covers the Sun completely, producing a total eclipse. The duration of totality can never be more than 8 minutes. Since the Moon's shadow is only just long enough to touch the surface of the Earth, totality is visible only over a restricted area. The eclipse of 22 September 1969 was total over part of Siberia. This photograph of it (below) was taken by the late Colin Hunt.

Annular Eclipse
left and below

When the Moon (a) is near apogee, its apparent diameter seen from the Earth (c) is smaller than that of the Sun (A), and even if the alignment becomes exact, the Moon is not big enough to hide the Sun completely, a ring of sunlight is left showing, producing an annular eclipse, as shown in the photograph below. The glorious phenomena of totality cannot be seen, and astronomers do not regard annular eclipses as being of any real importance, though they are certainly always interesting to watch.

Eclipses Total y Anular de Sol

Eclipse Solar

Eclipse Anular

Eclipse Parcial

Eclipse Total

Duración del Año o Mes

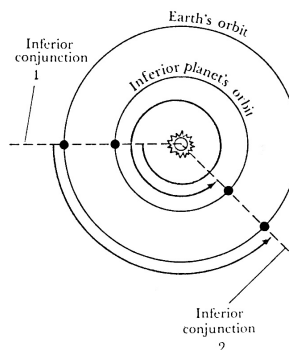
- **Período Sideral:** es el tiempo que tarda en completar una órbita (o revolución) c/r a las “estrellas fijas”
- **Período Sinódico:** es el tiempo entre dos configuraciones sucesivas Tierra-Objeto-Sol (entre dos conjunciones u oposiciones ...)

Si P = Período Sideral de un planeta, E=1 año es el período sideral del Sol (Tierra) y S es el período sinódico de un planeta, entonces, para un planeta inferior se tiene:

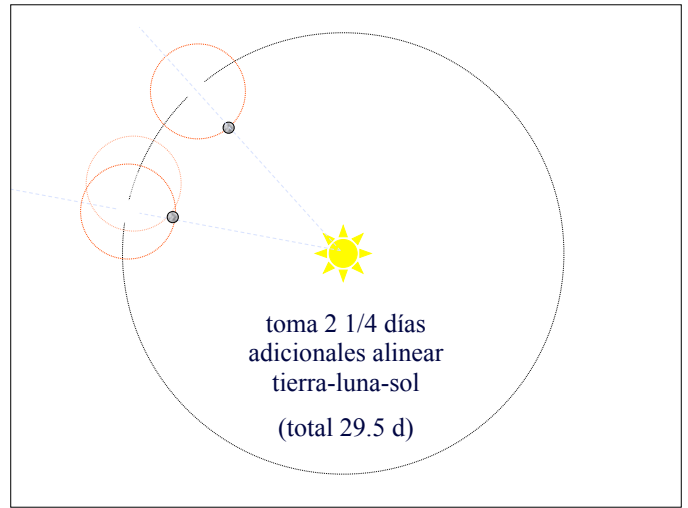
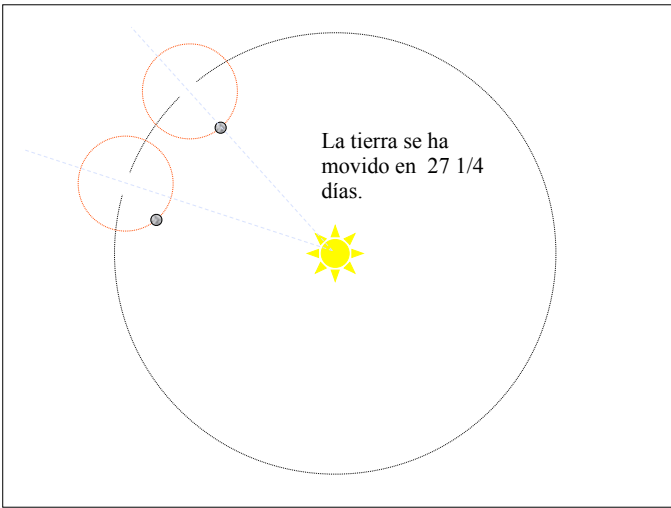
$$\frac{1}{P} = \frac{1}{E} + \frac{1}{S}$$

(Ver box 4-1 del Kauffmann)

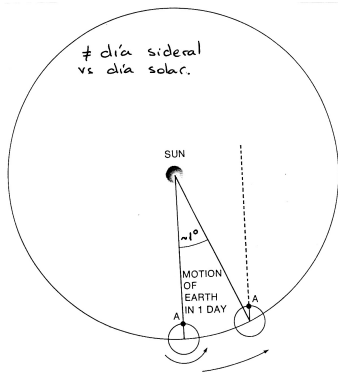
Año Sideral vs Año Solar



$$\frac{1}{P} = \frac{1}{E} + \frac{1}{S}$$



Día Sideral vs Día Solar

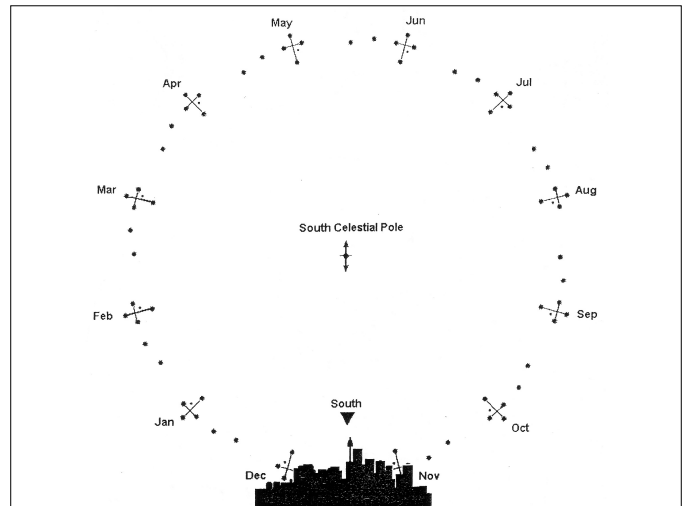


Sol se "atrassa" cada día aproximadamente 4 min = 1° c/r a las estrellas fijas.

1 día = 24 h (solares medias)
1 día sideral = 23h56m4s

Cada mes las estrellas salen dos horas antes que el mes anterior.

1 año = 365.24 días solares
= 366.24 días siderales



Período Sinódico Lunar = 29.5 d

(mes Lunar)

Período Sideral Lunar = 27.3 d

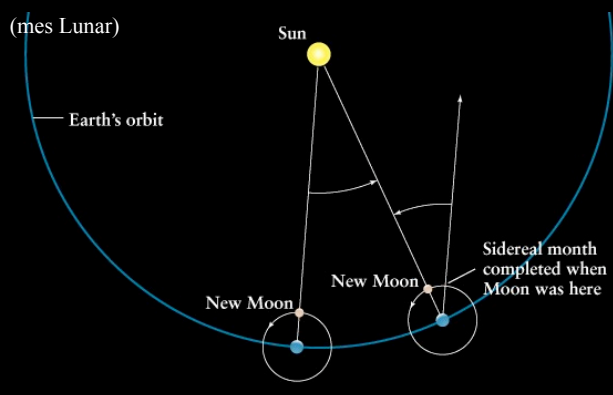


Table 2-1
Synodic and Sidereal Periods of the Planets

| | Synodic Period | Sidereal Period |
|---------|----------------|-----------------|
| Mercury | 116 d | 88 d |
| Venus | 584 d | 225 d |
| Earth | — | 1.0 yr |
| Mars | 780 d | 1.9 yr |
| Jupiter | 399 d | 11.9 yr |
| Saturn | 378 d | 29.5 yr |
| Uranus | 370 d | 84.0 yr |
| Neptune | 368 d | 164.8 yr |
| Pluto | 367 d | 248.5 yr |