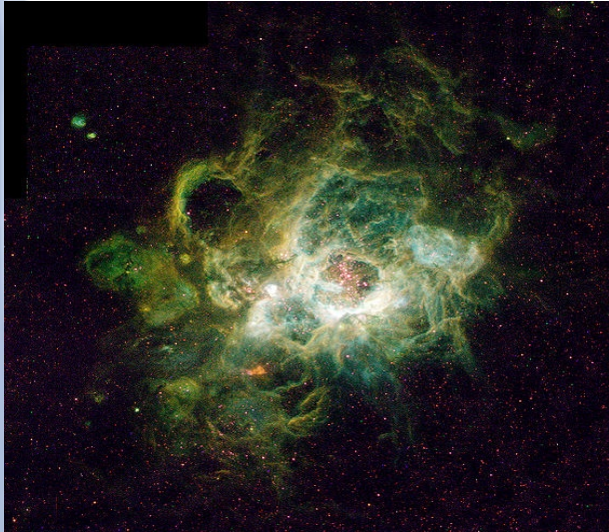
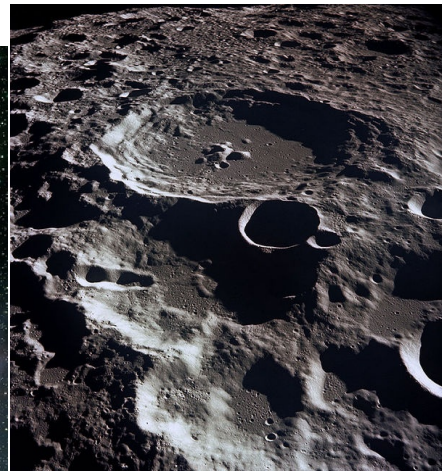


An Introduction to Astronomy

Part 2



Dr. Zainab Awad



Lecture 3
30/11/2013

In the previous lecture

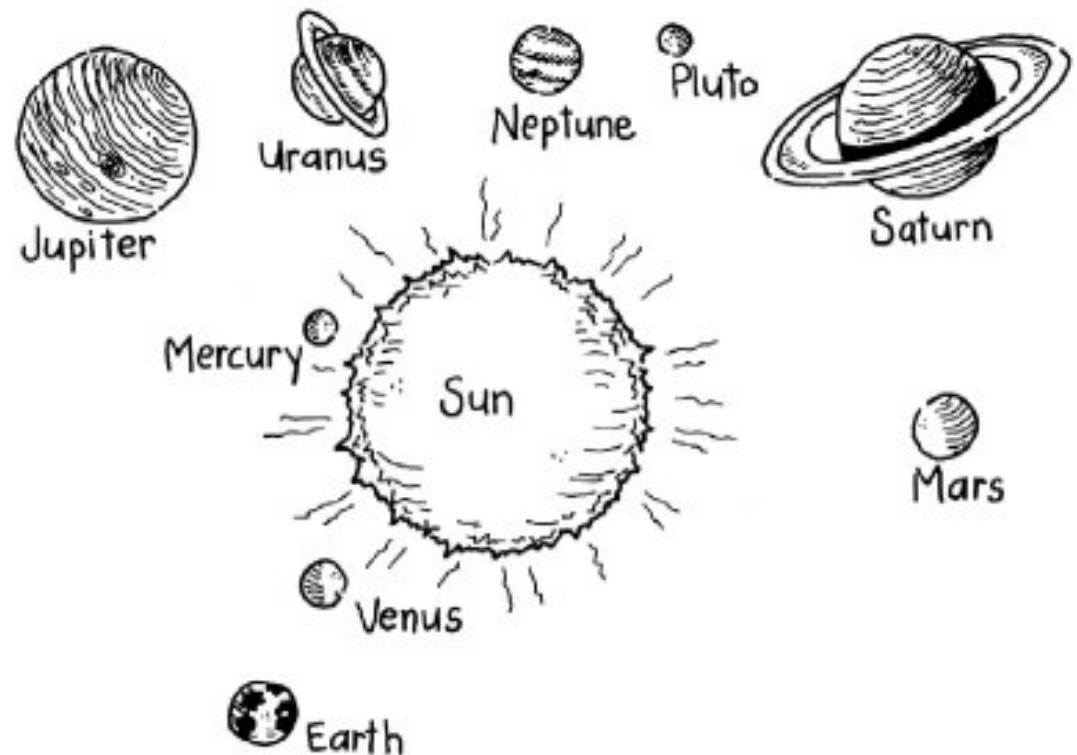
Interstellar Medium (ISM)

- * What?
- * Where?
- * Cycle
- * Important



In this lecture

The Solar System



→ An Overview

→ Members:

The Sun / Planets/ Asteroids/ & Comets

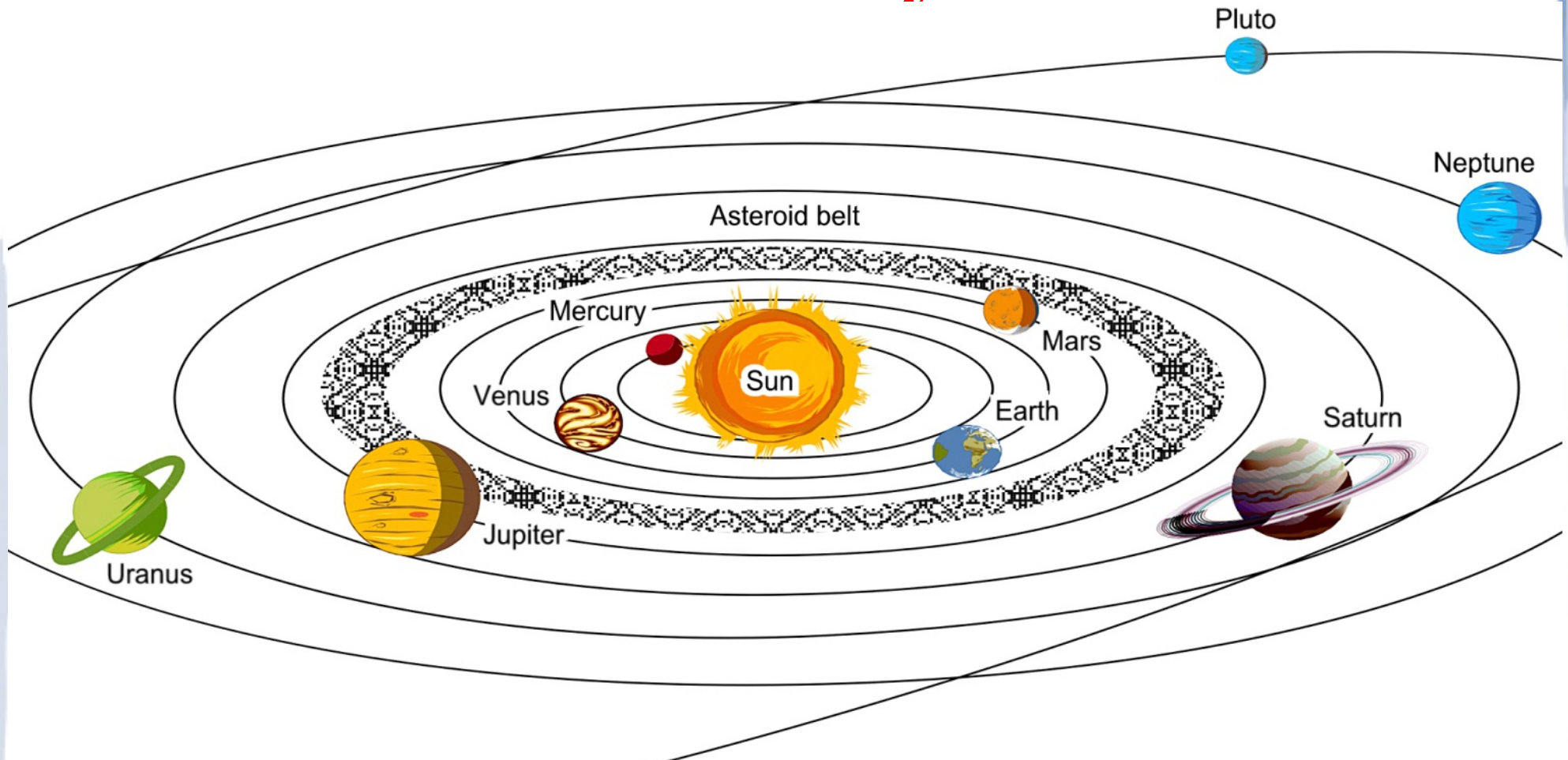
→ Moon – Earth System

→ Astronomical Phenomena

A thick, hand-drawn blue border with a slightly irregular, painterly texture surrounds the entire slide.

The Solar System: An Overview

The Solar System Overall Layout

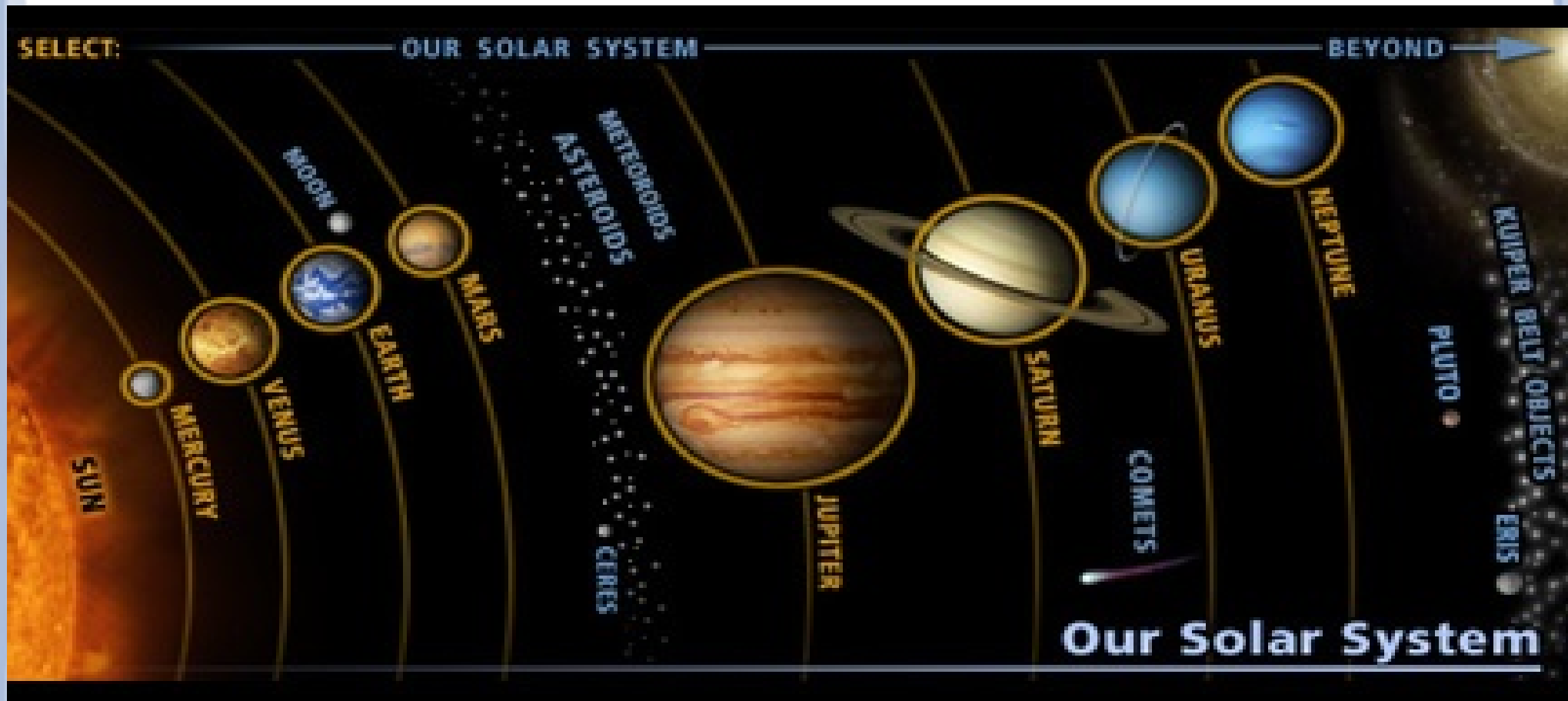


Flat system

Same rotational plane around the Sun

The Solar System

Overall Layout



The Solar System: Members

The Sun

Mother of the Solar System

Sun

Jupiter

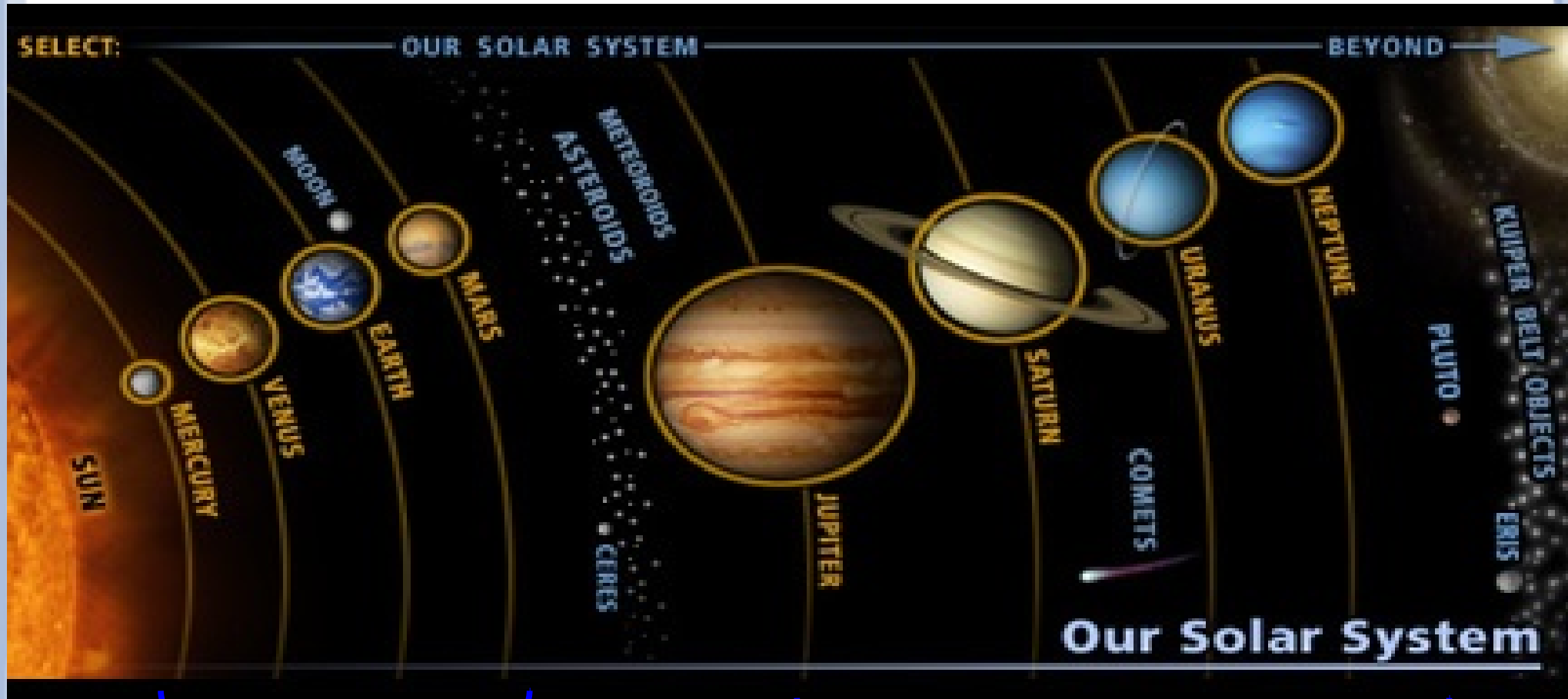
Earth

Pluto



Members of the Solar System

Planets

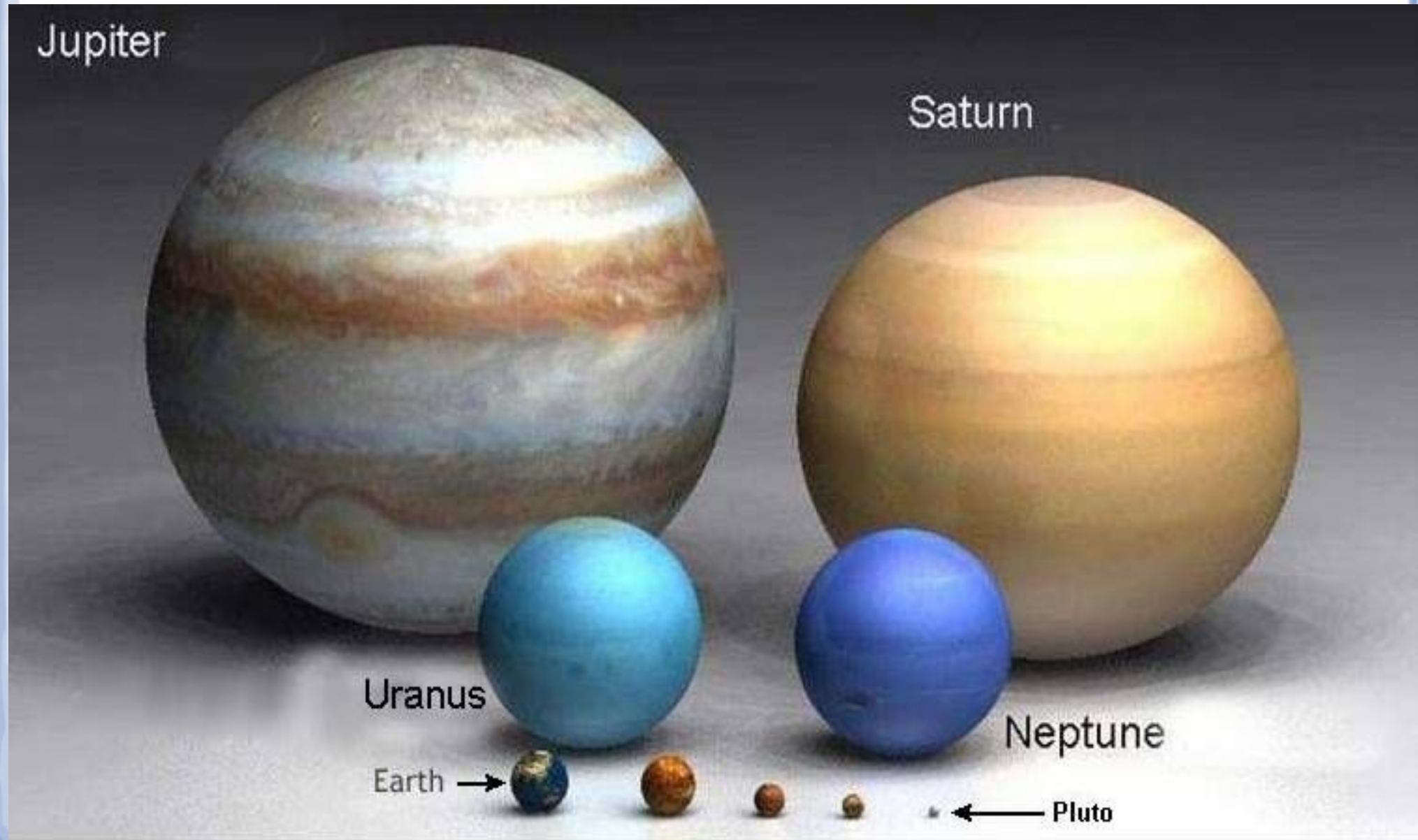


Inner planets

Outer planets

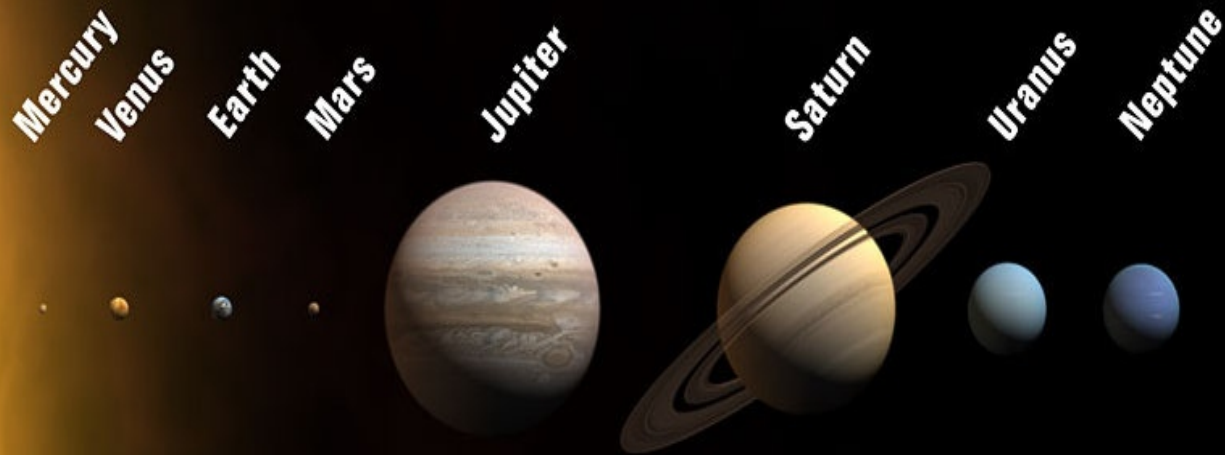
Members of the Solar System

Planets



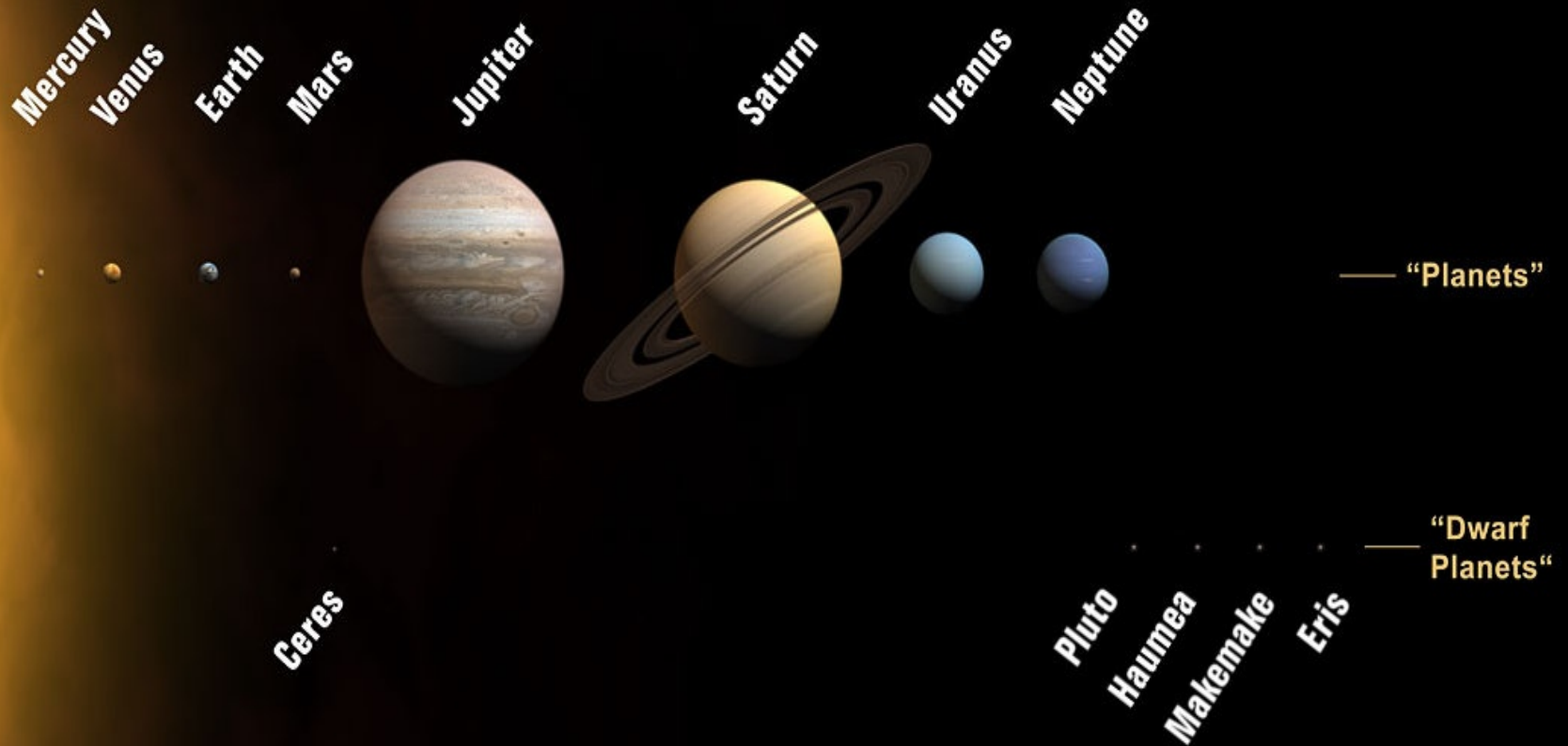
Members of the Solar System

Planets



Members of the Solar System

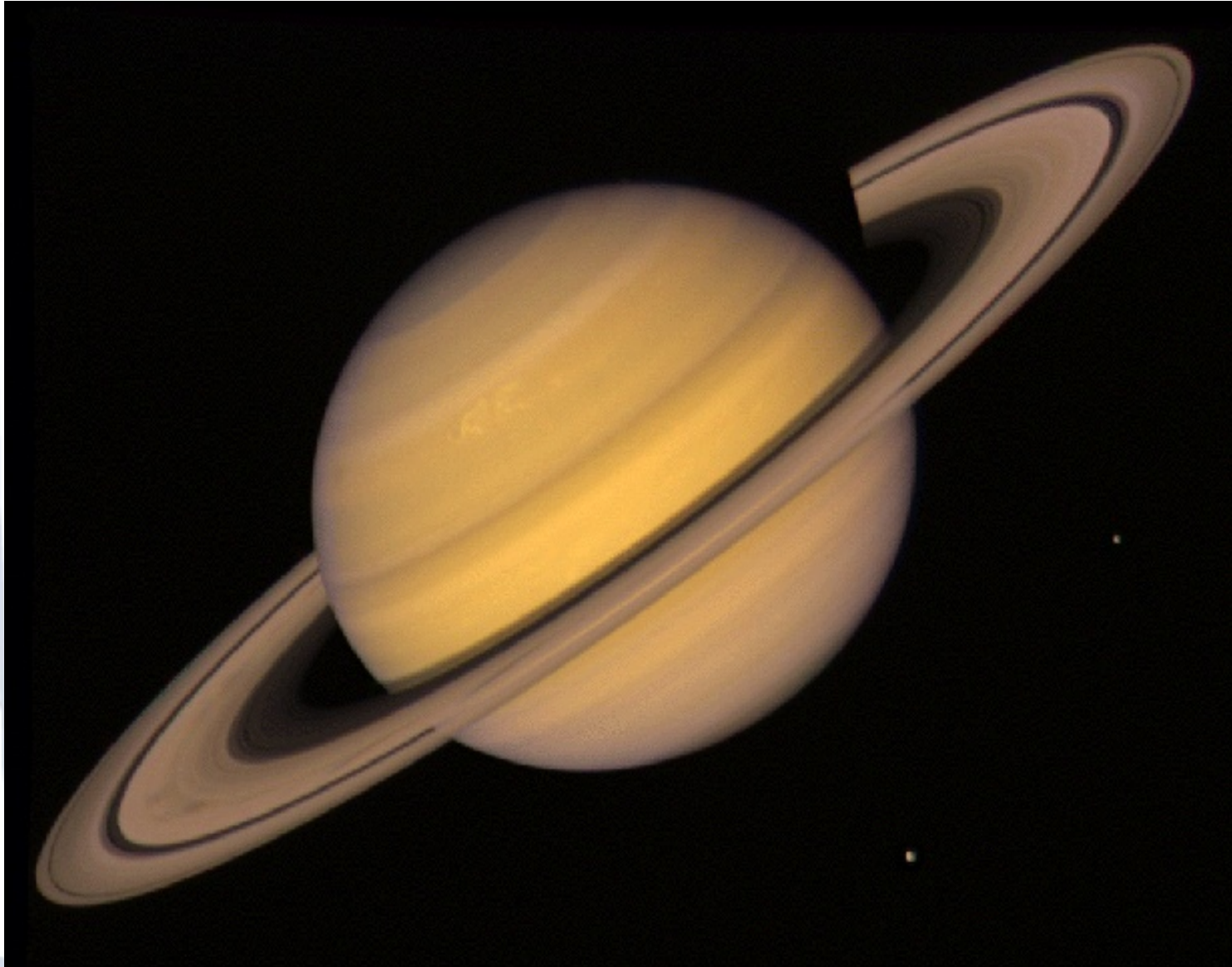
Planets



The **NEW** Solar System

Members of the Solar System

Planets: Ring System



Saturn:
the lord
of the
rings

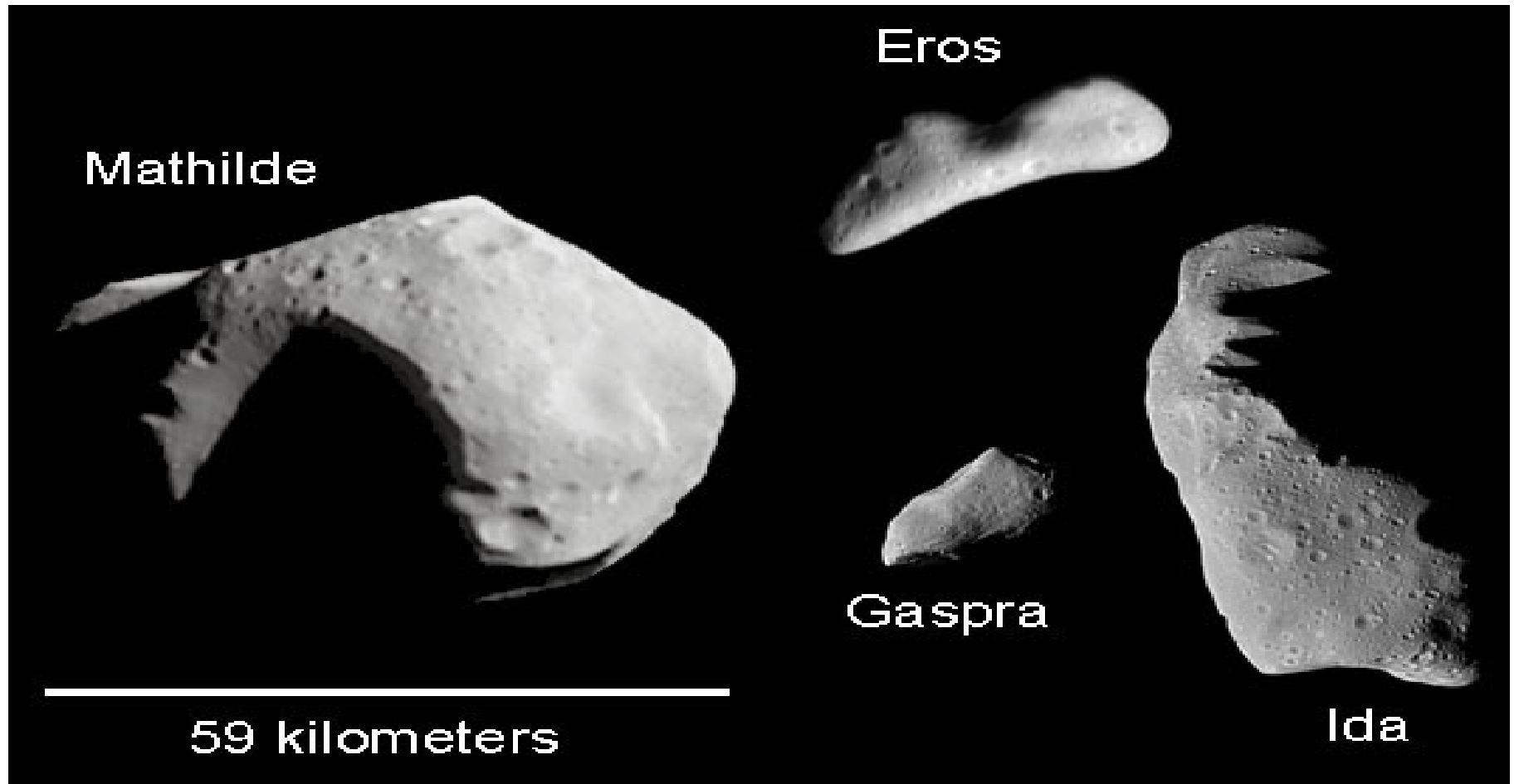
Members of the Solar System

Planets: Satellites



Members of the Solar System

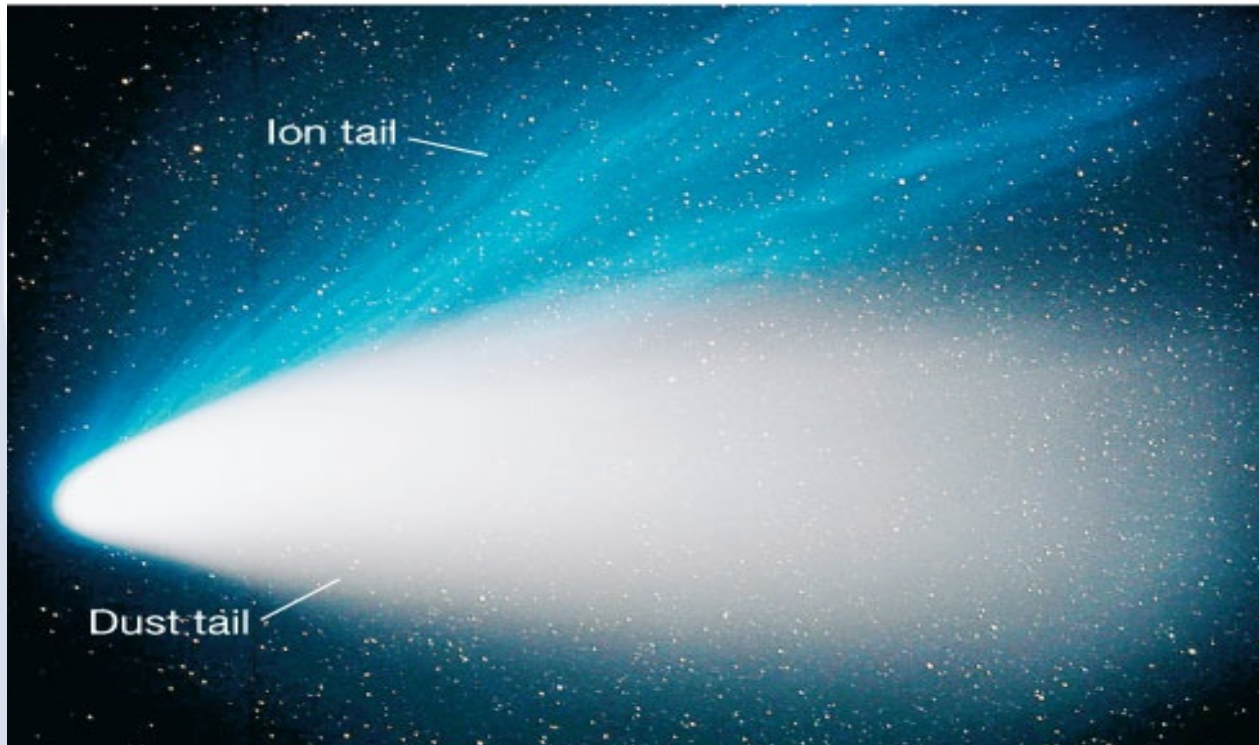
Asteroids



Rocks orbiting the sun between Mars and Jupiter

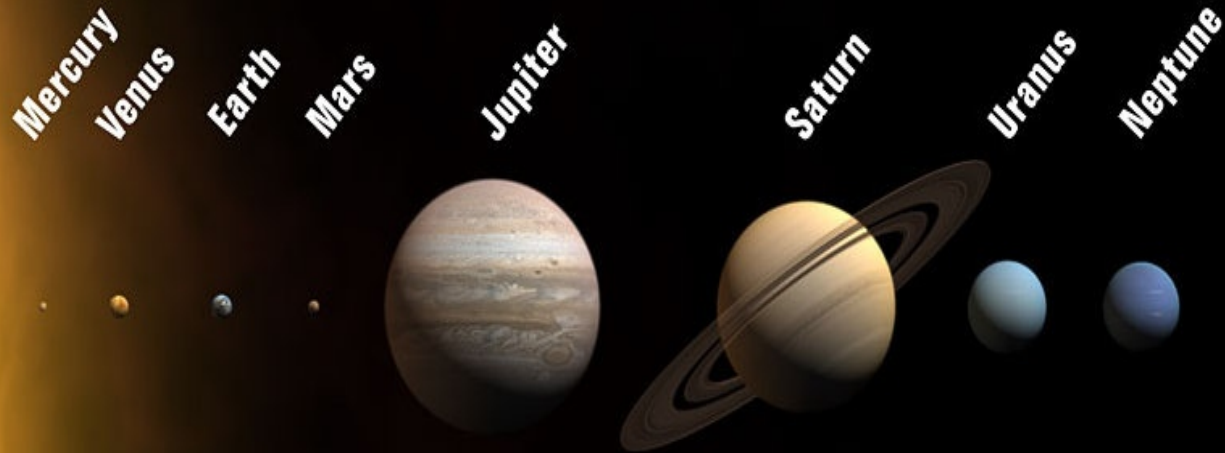
Members of the Solar System

Comets

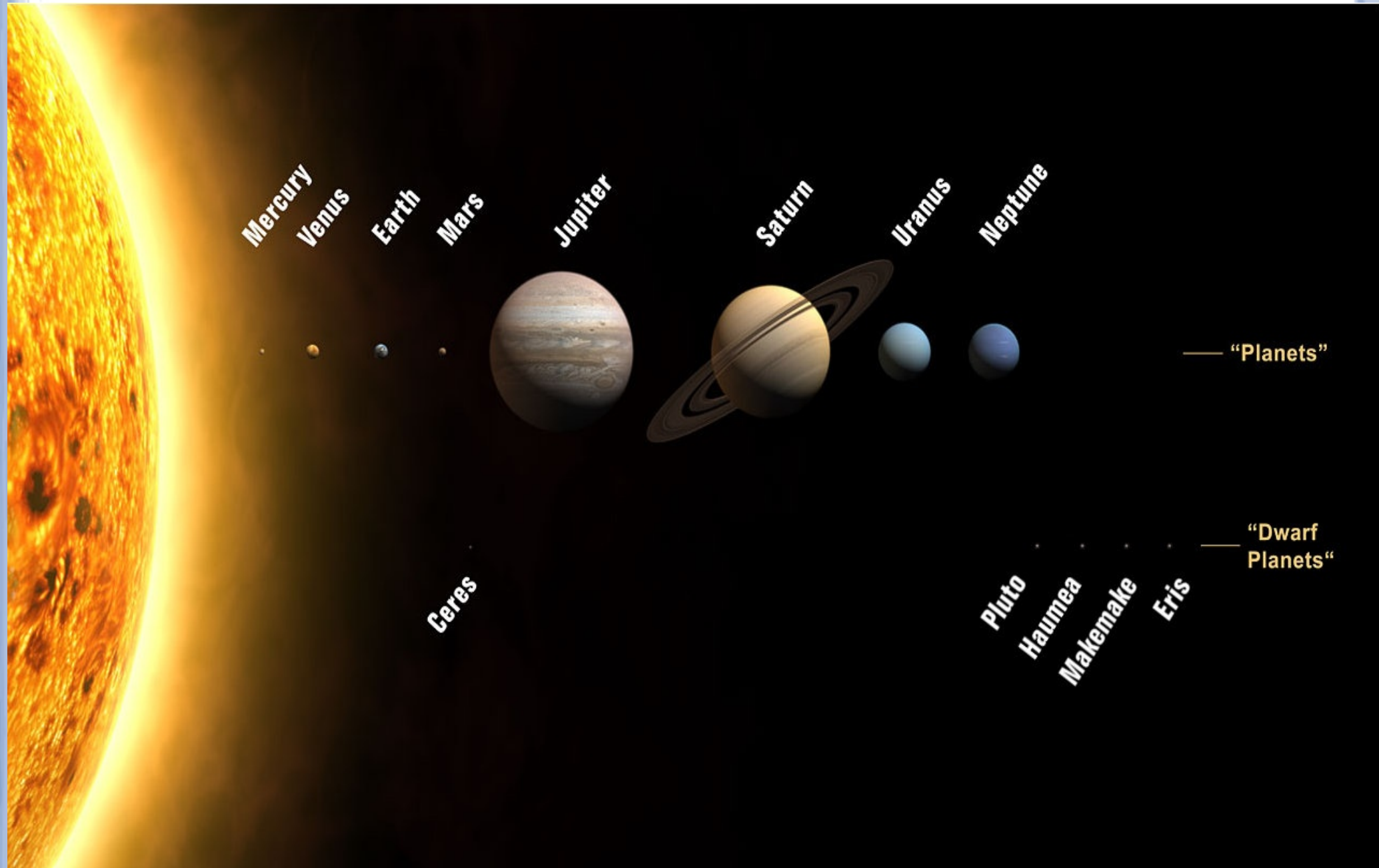


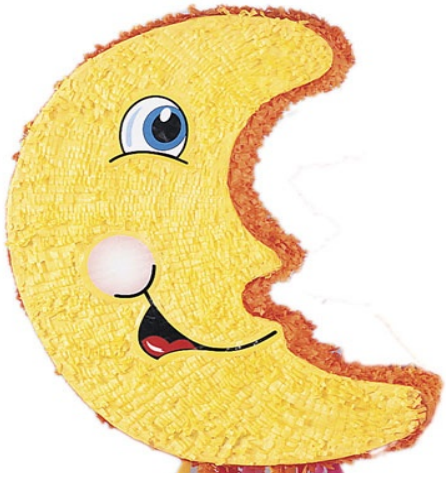
ISON just
passed by
Earth

The **NEW** Solar System



The **NEW** Solar System

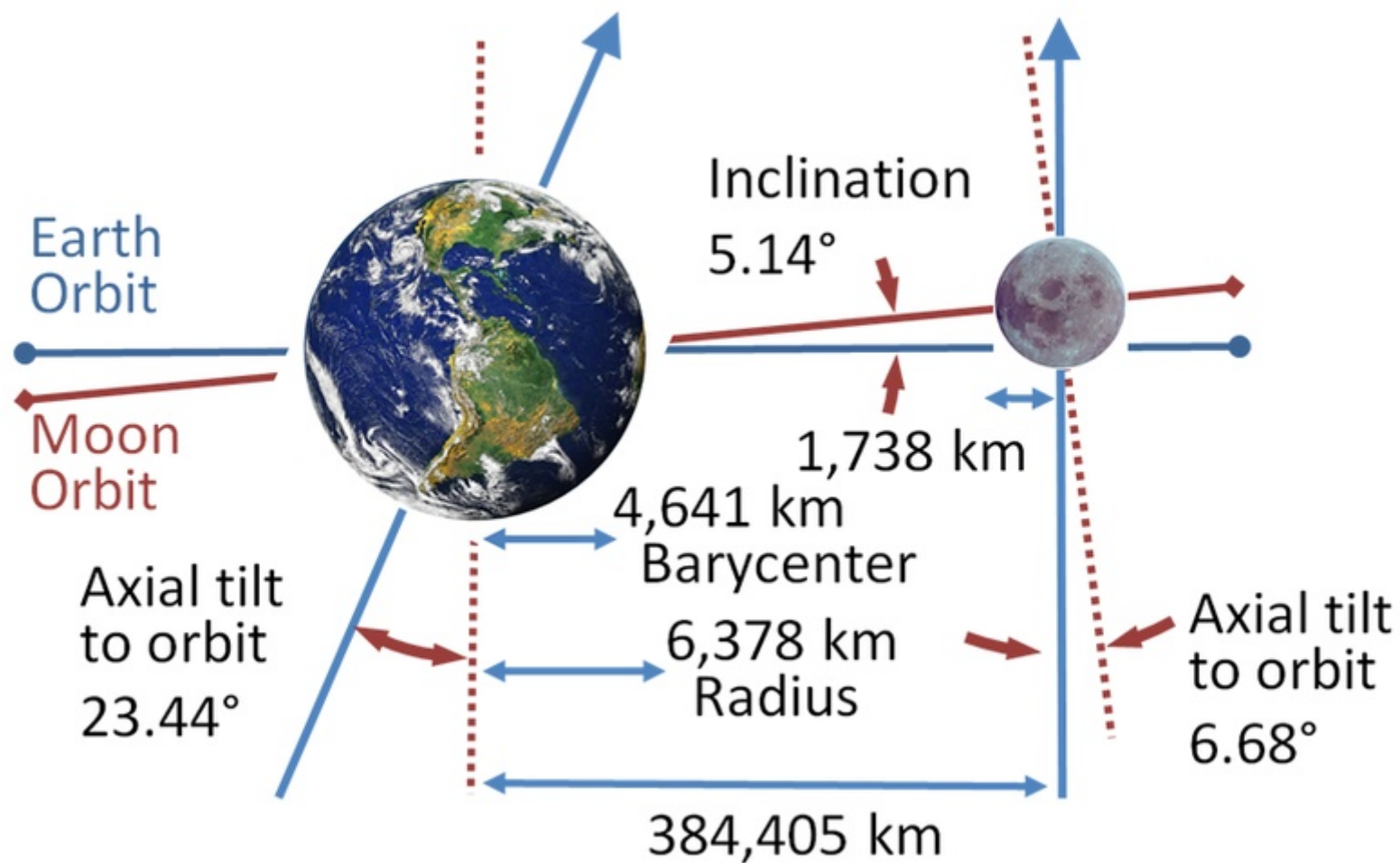




Moon-Earth System

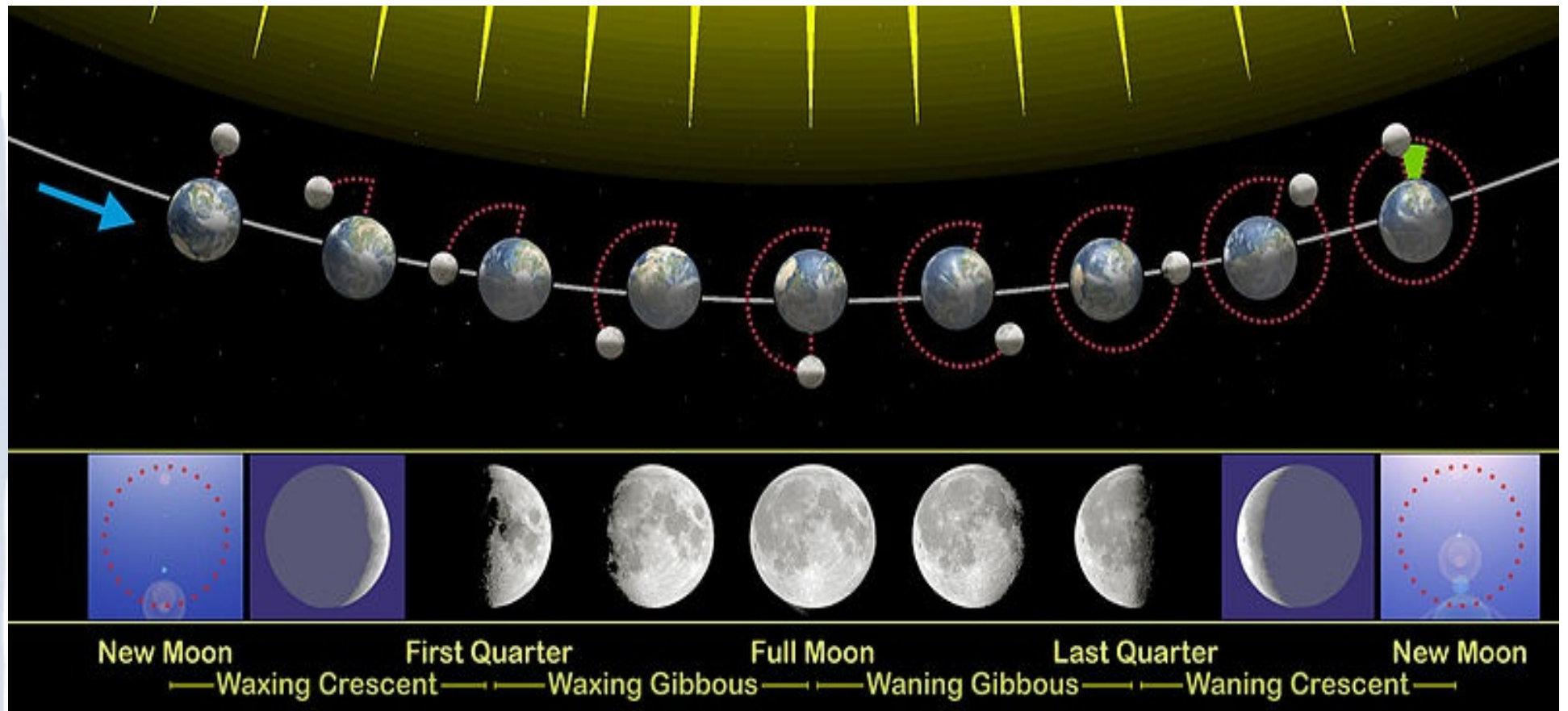
Moon – Earth System

Lunar Orbit



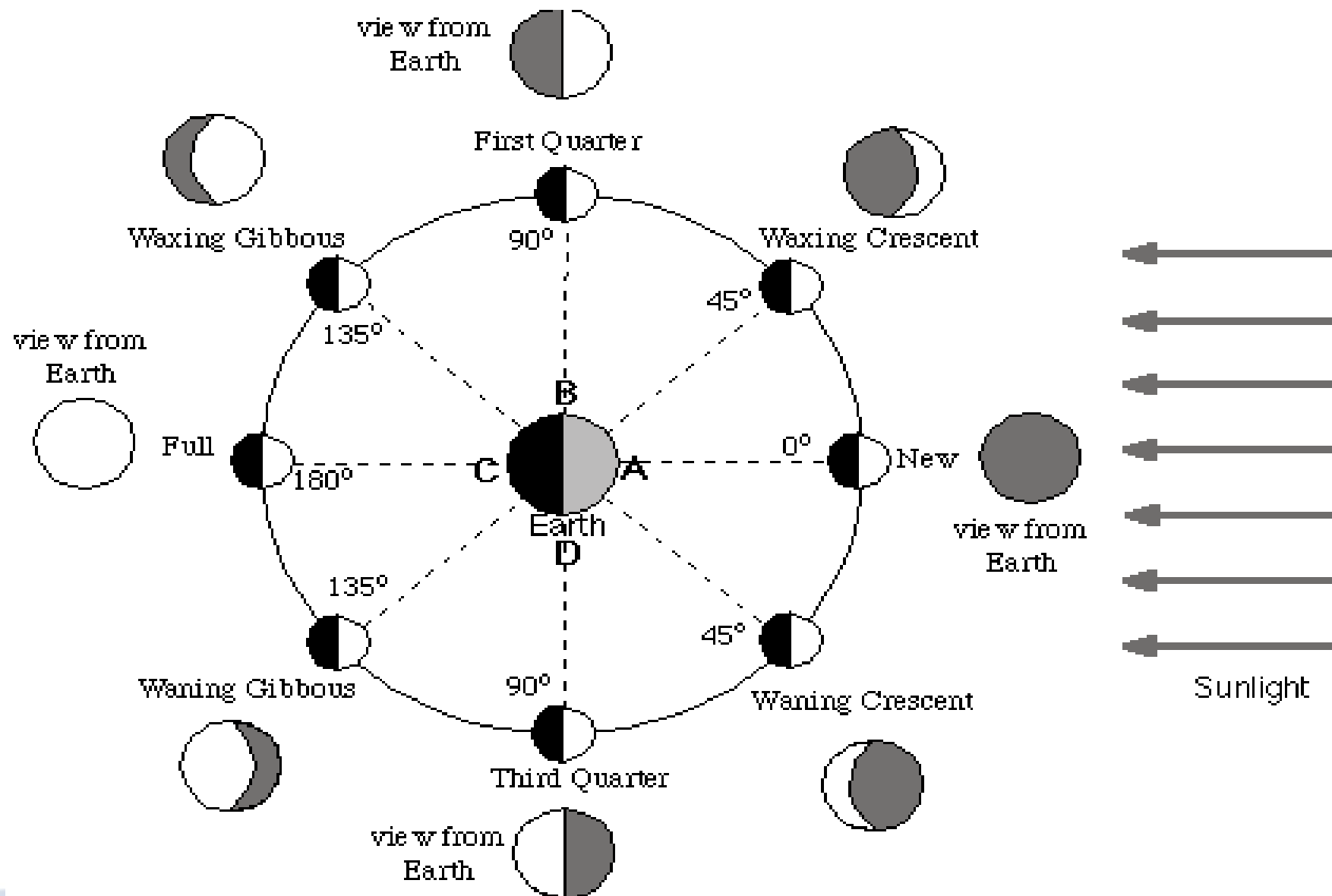
Moon – Earth System

Lunar Phases



Moon – Earth System

Lunar Phases



Astronomical Phenomena

Astronomical Phenomena

- * Seasons
- * Eclipses
- * Aurora
- * Meteor Showers
- * Conjunction
- * Transit

Astronomical Phenomena

Seasons

Impact of the tilt of the rotational axis

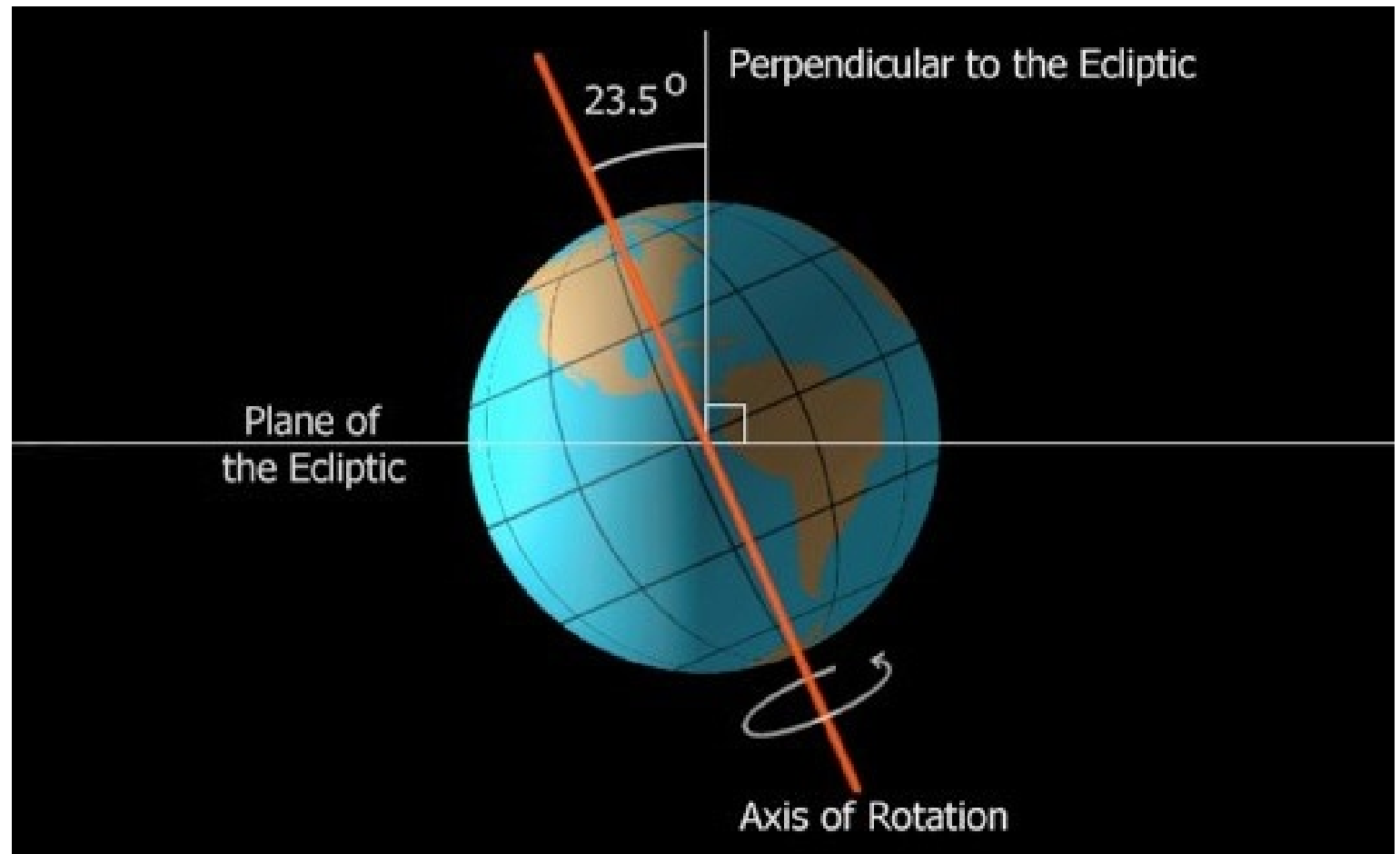


The most important influence of the tilt of the rotational axis is the variation of the amount of heat reaches the planet's surface. This variation leads to the well-known event of “seasons”

Earth's Orbit

Earth's Rotation:

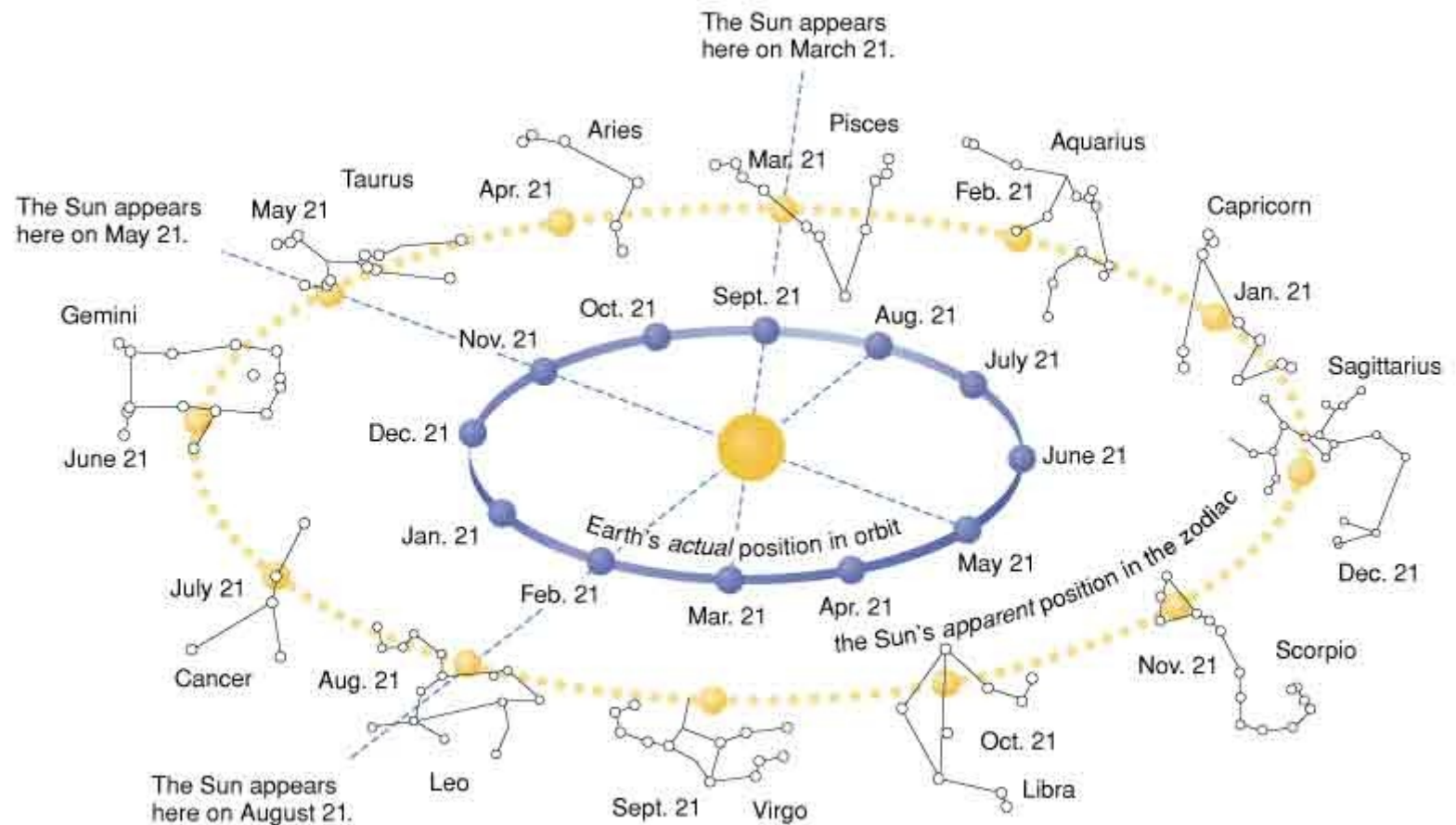
The Earth's rotational axis is tilted by an angle of 23.5° on the Ecliptic



Earth's Orbit

Ecliptic:

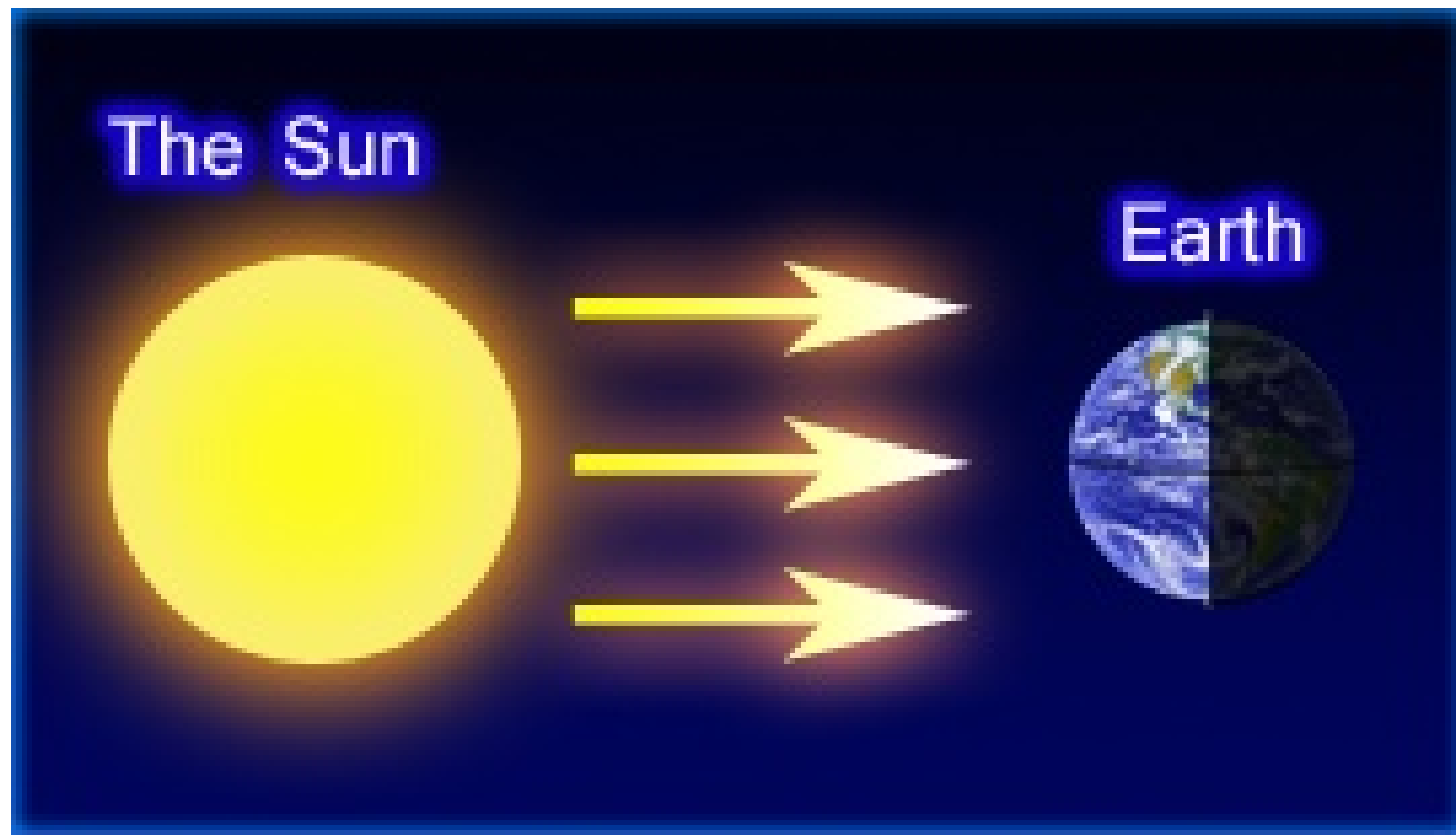
It is the Earth's orbit around the sun. It is famous of the 12 zodiac signs



Earth's Orbit

Earth's Rotation:

The rotation causes the succession of day and night
Happens in ~ 24 hrs \equiv 1 Earth's day



Earth's Orbit

Earth's Revolution:

The orbital motion of the Earth around the sun.

It takes 365.25 Earth's day \equiv 1 Earth's year

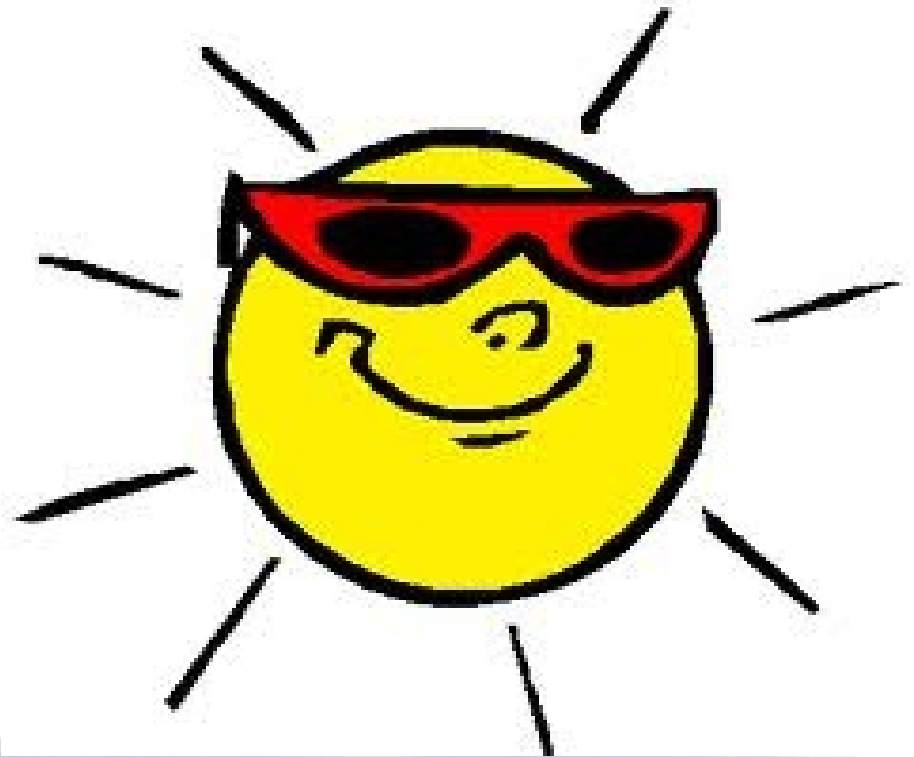
Earth's revolution causes the season variations.



Seasons

Reasons to have Seasons:

- 1- The tilt of the earth's rotational axis on the ecliptic
- 2- The variation of the amount of sunlight reaching the earth's surface.



Seasons

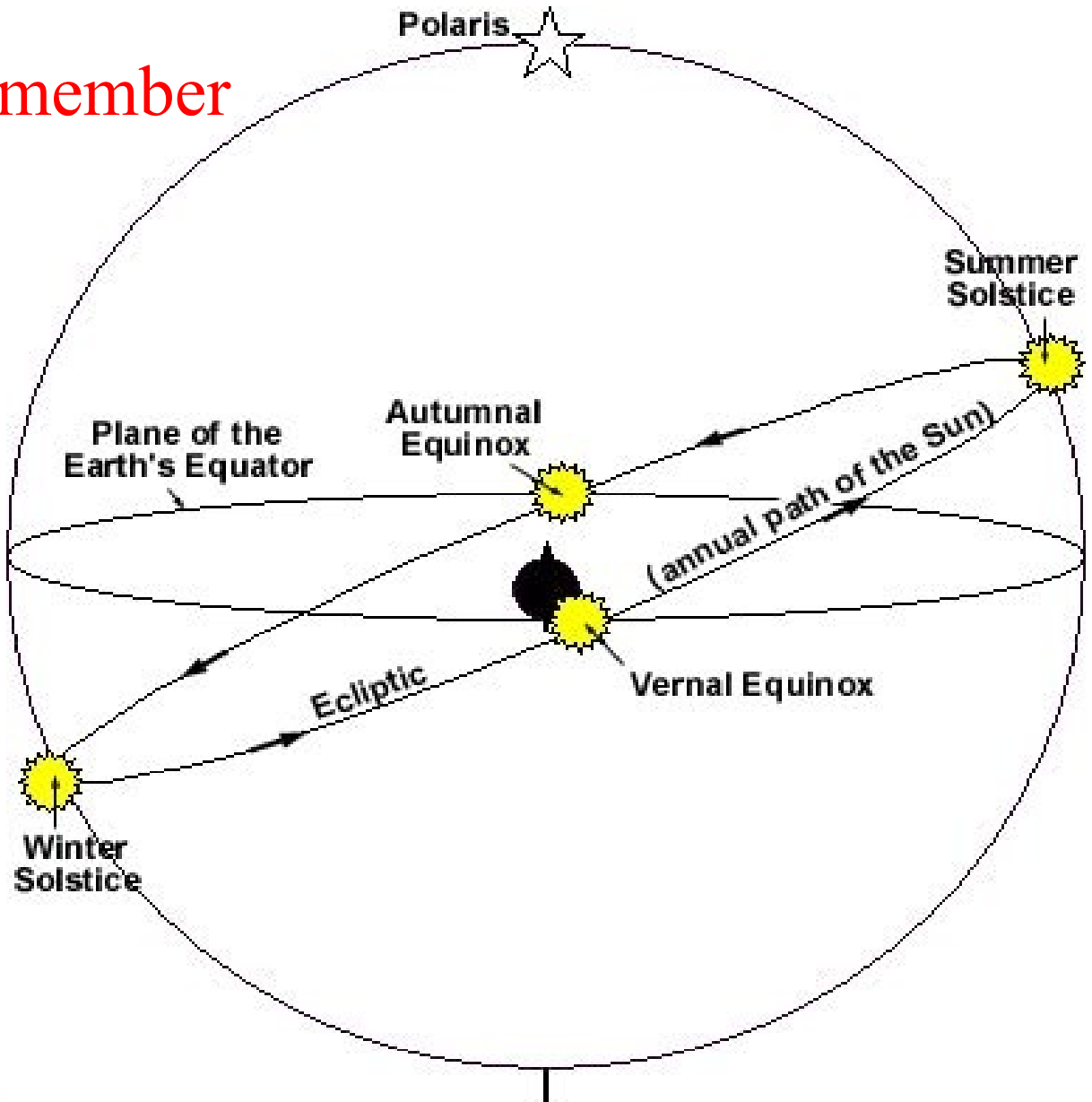
Terms and dates to remember

Summer solstice
23 June

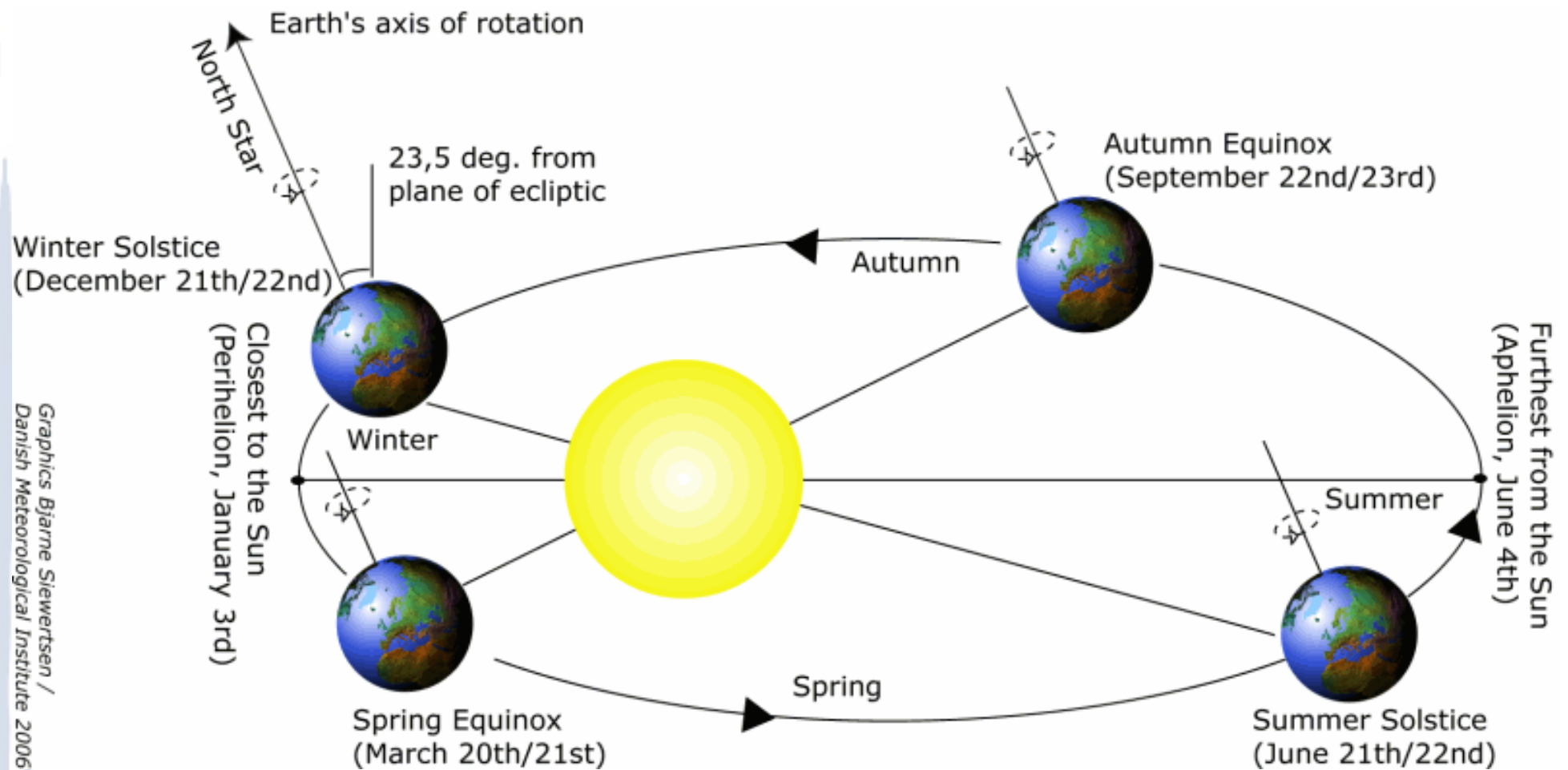
Winter Solstice
23 Dec.

Vernal Equinox
21 March

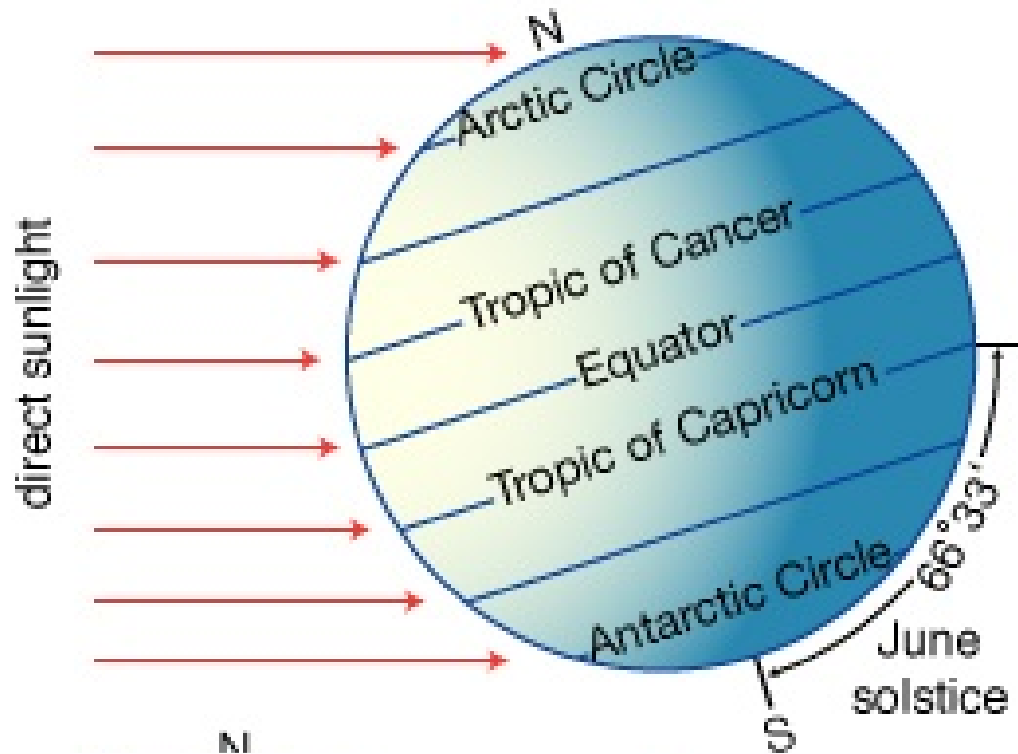
Autumn Equinox
21 Sept



Seasons



Seasons



Summer

Amount of
sunlight reaching
earth is more @ N

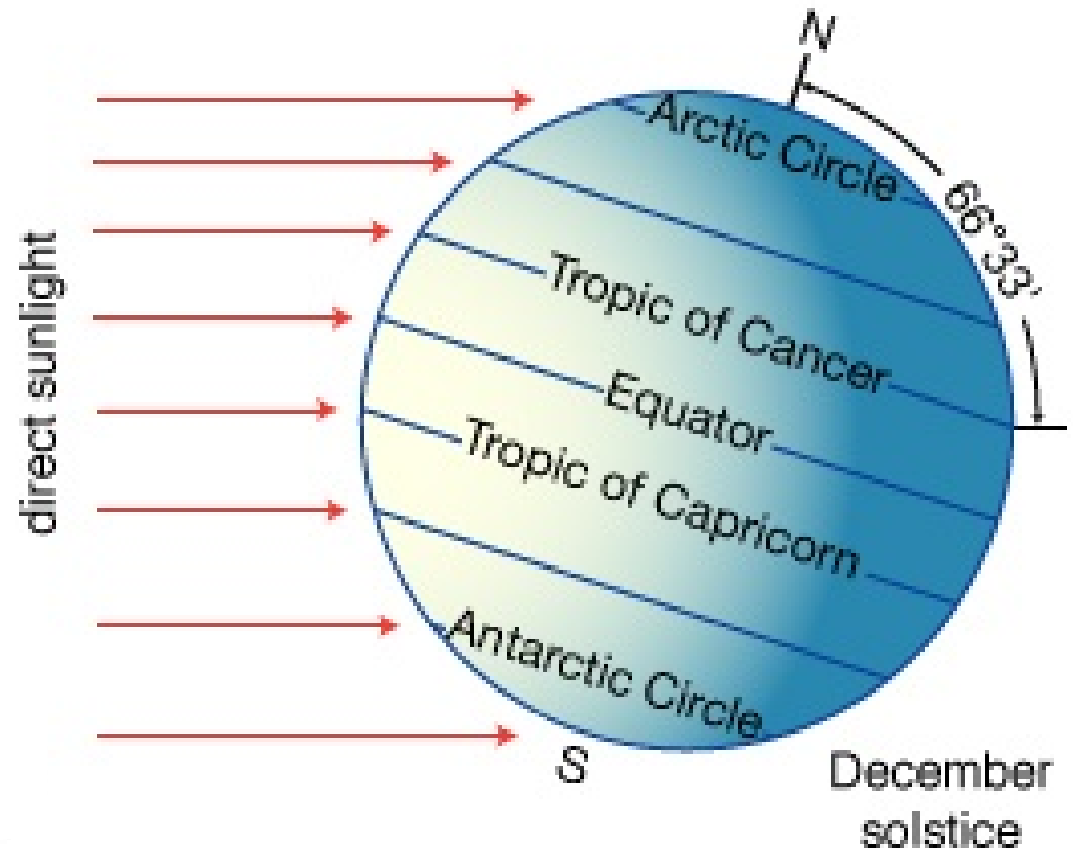
days are longer

Seasons

Winter

Amount of sunlight
reaching earth is less
@ N

days are shorter due to
more sunlight

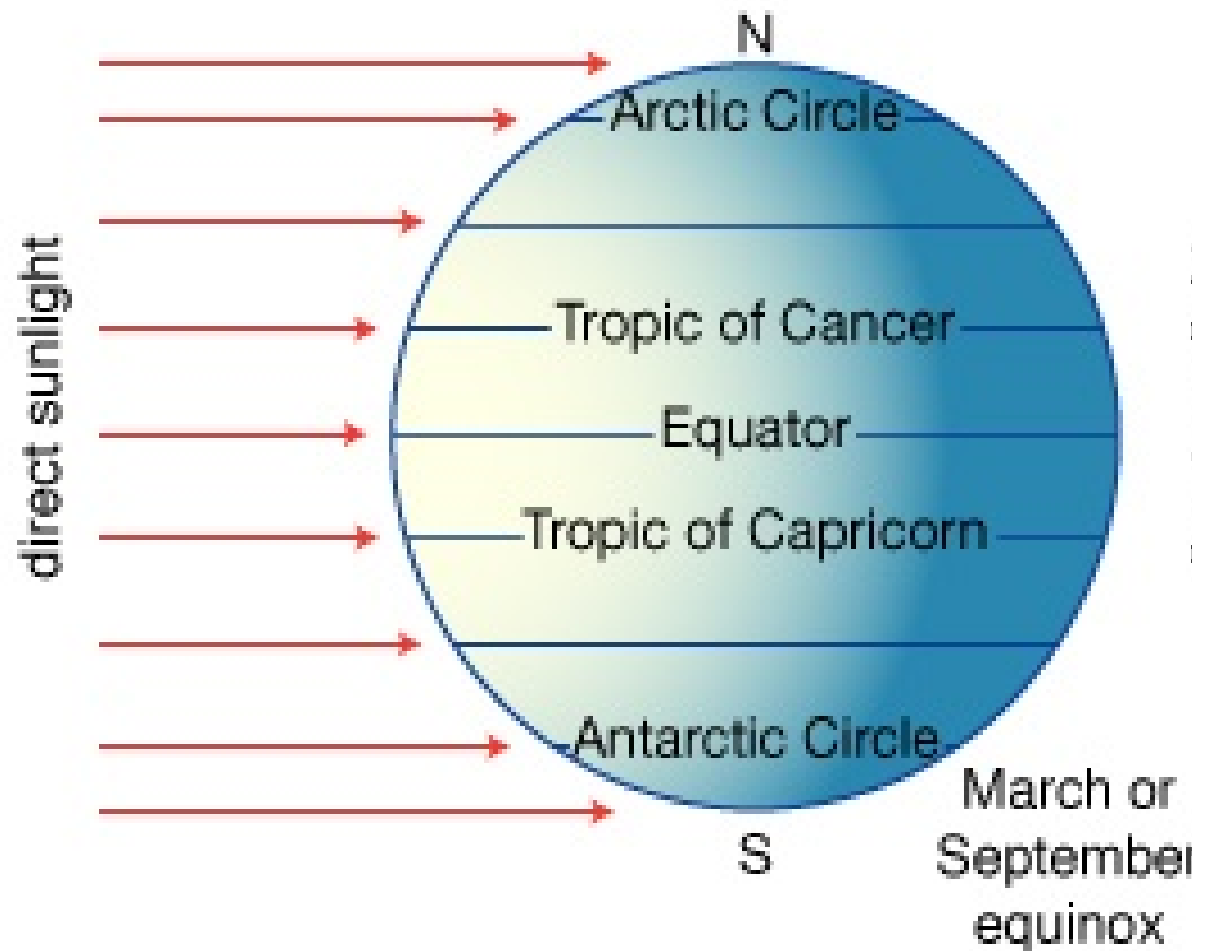


Seasons

Spring or Autumn

Amount of
sunlight reaching
earth @ N = @ S

length of days =
nights



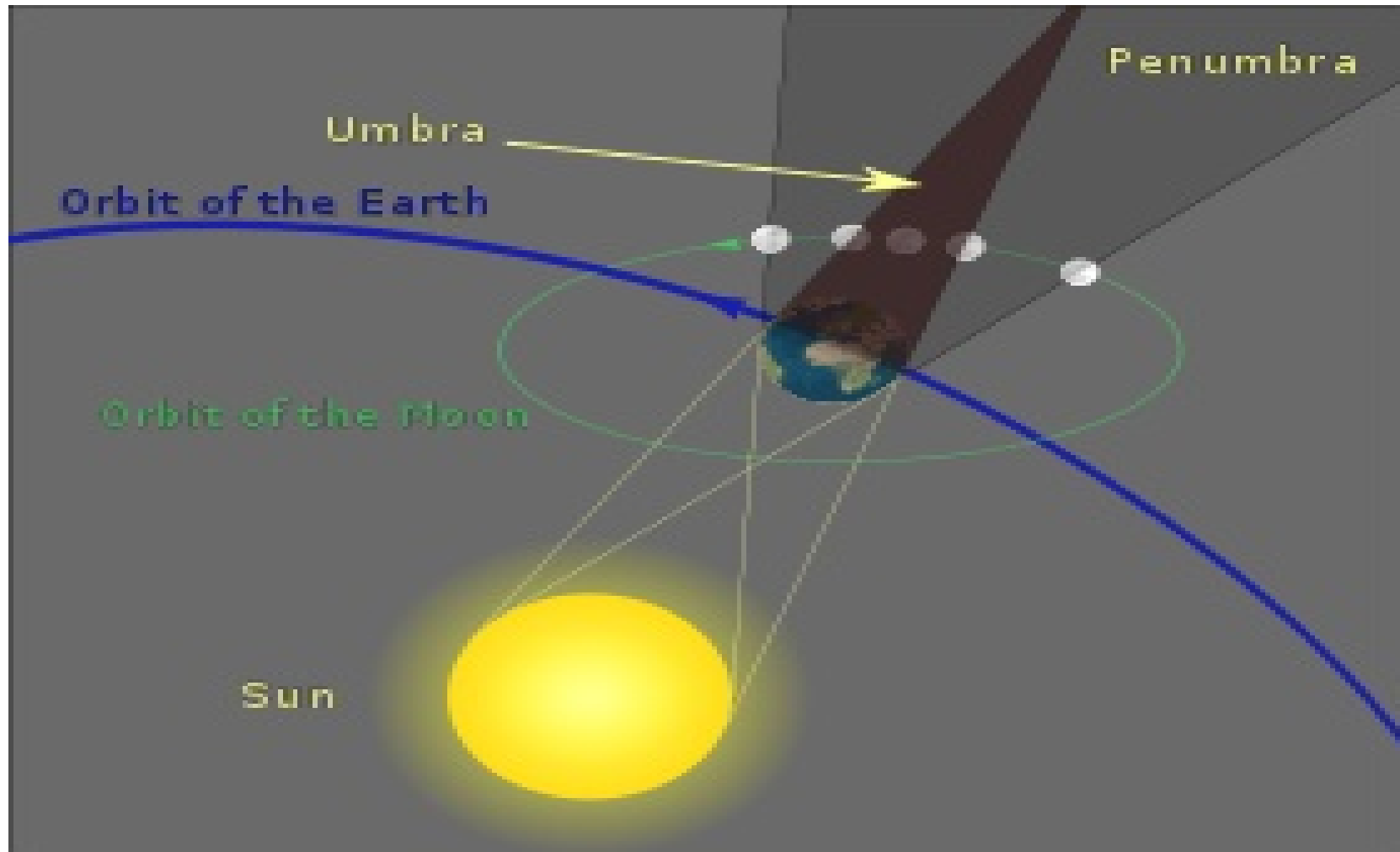
Astronomical Phenomena

Eclipses

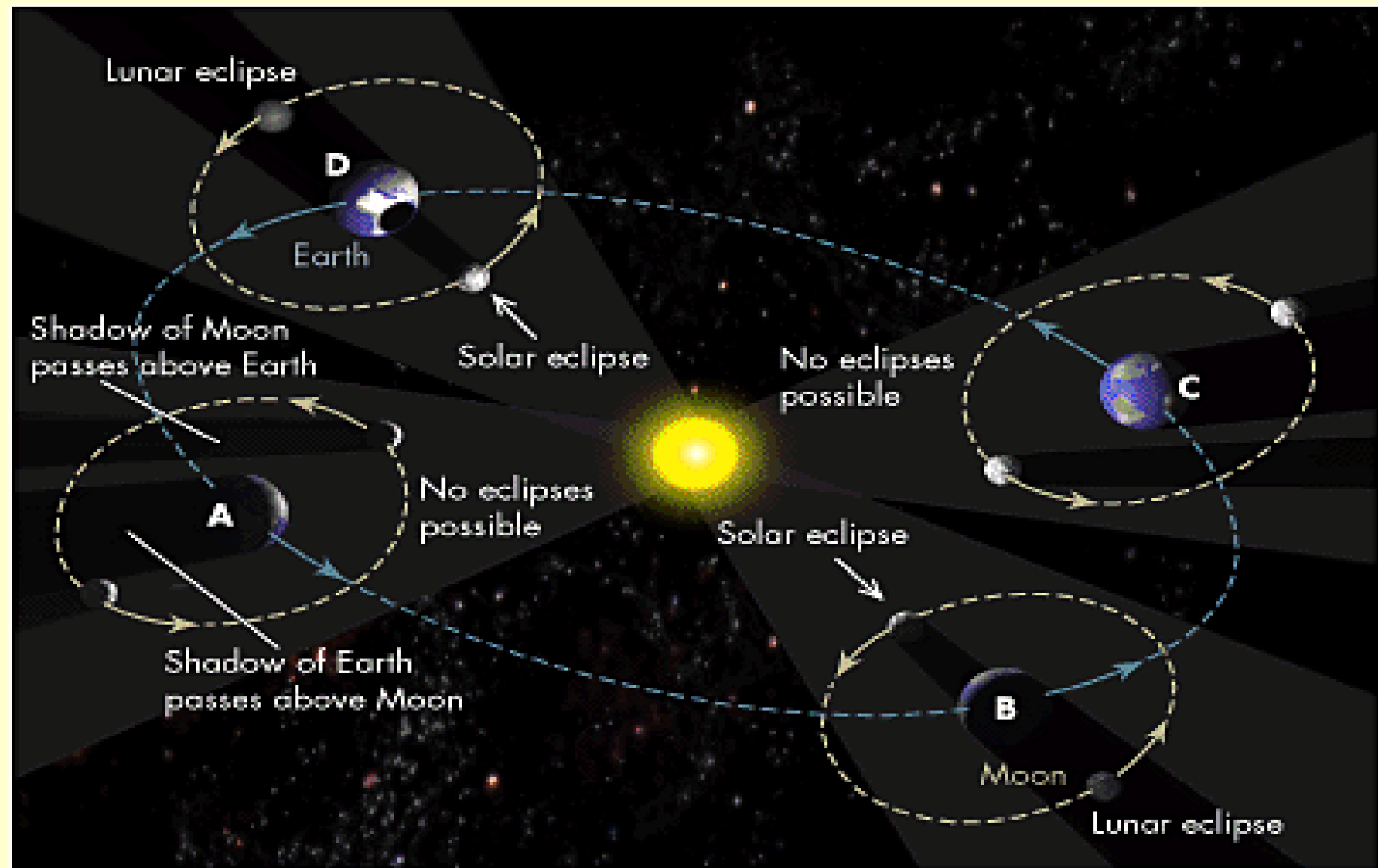
Eclipses

Eclipse

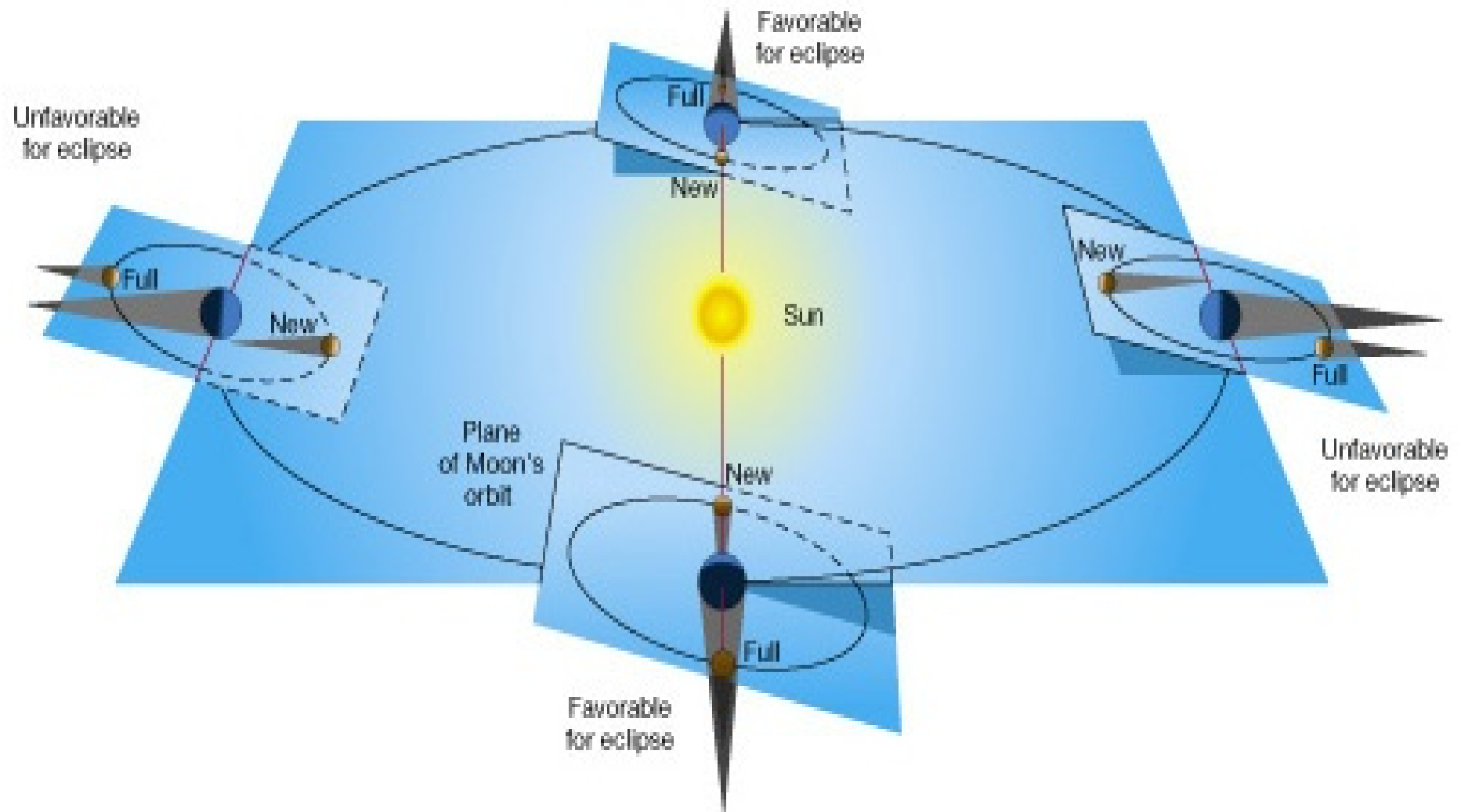
one body hides another while they rotate each other



Eclipses

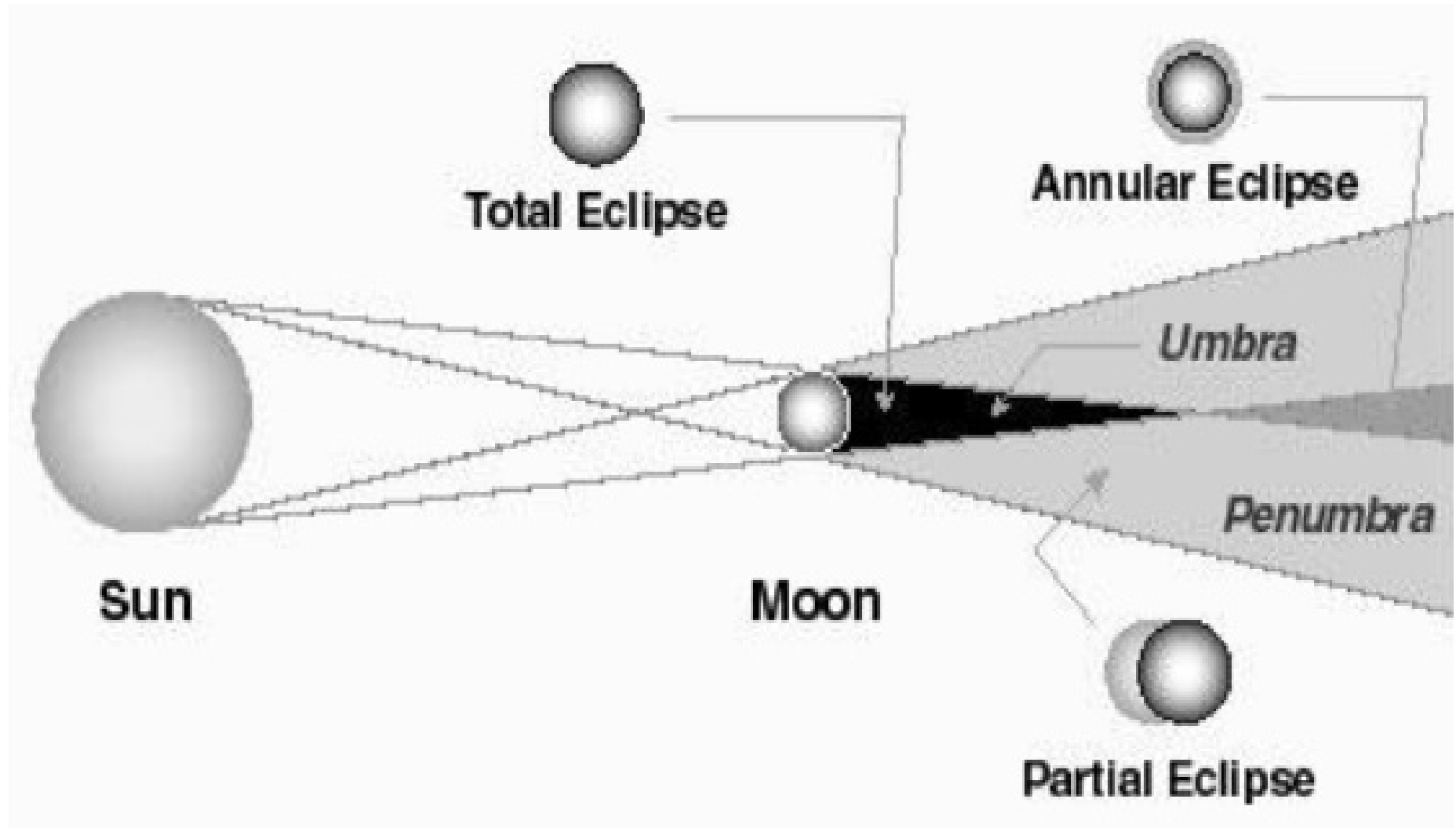


Eclipses



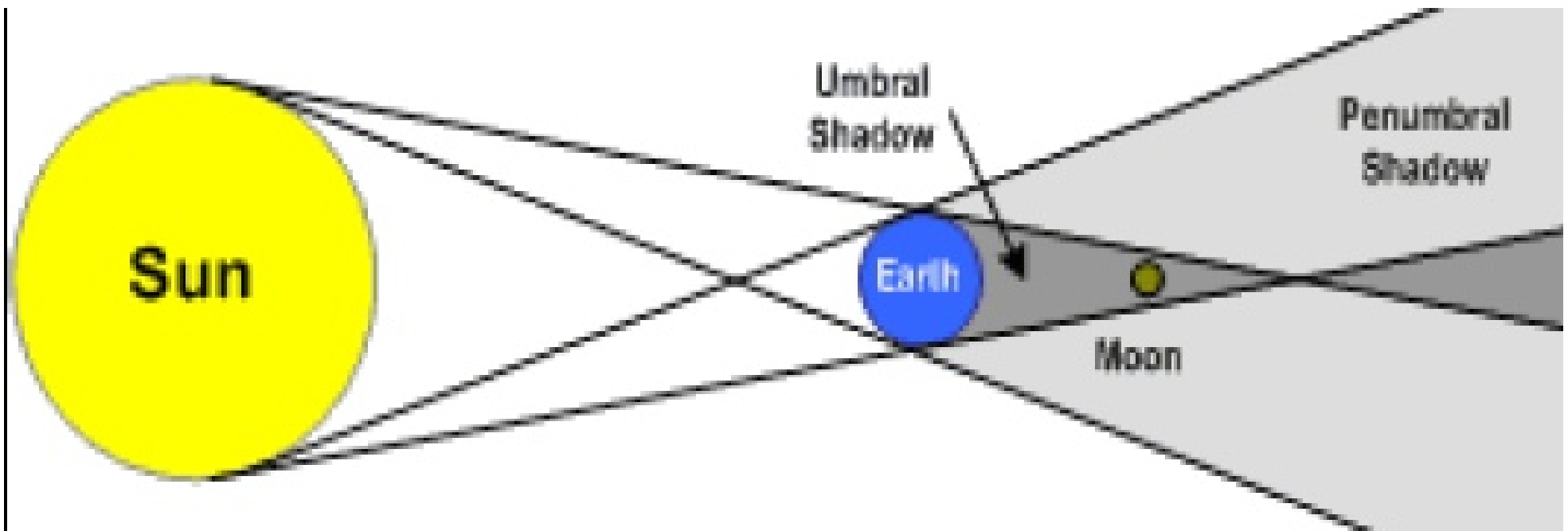
Eclipses

Solar Eclipse



Eclipses

Lunar Eclipse



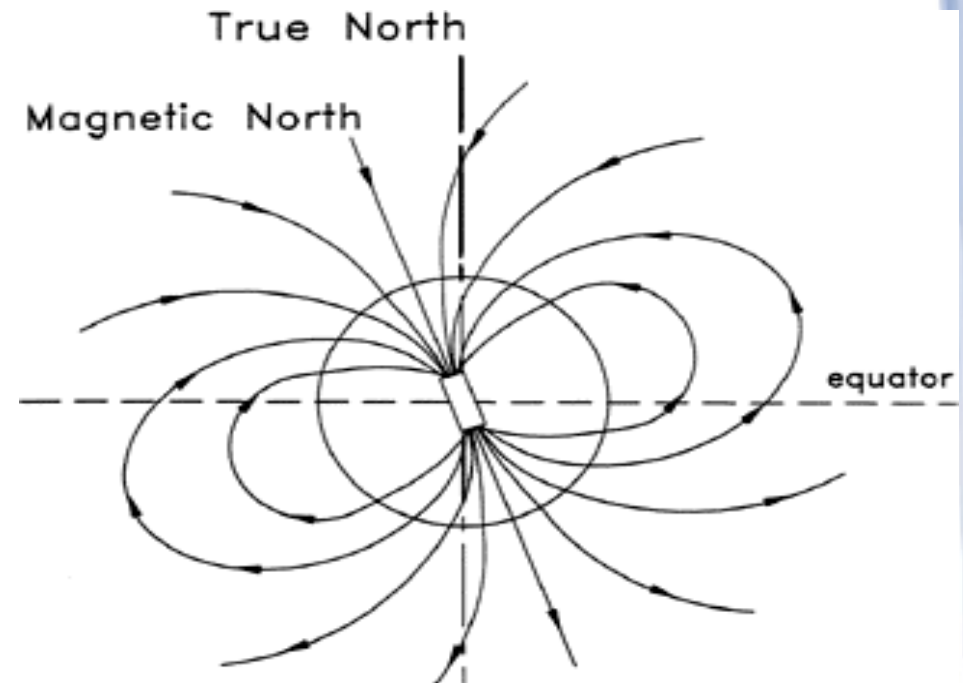
Astronomical Phenomena

Aurora

Astronomical Phenomena

Aurora

- occur at the polar area
- due to the interaction of the solar particles with the earth's atmosphere particles



Astronomical Phenomena

Conjunction

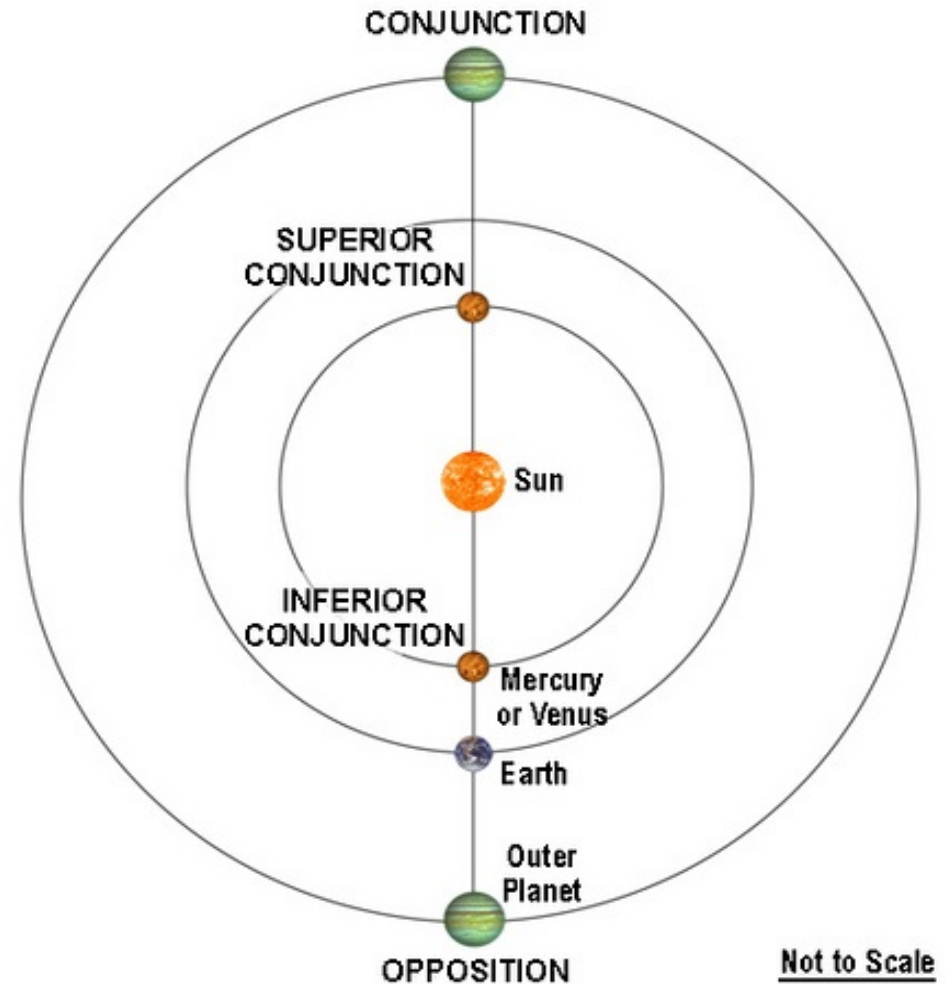
Conjunction

Conjunction

- occur when two planets are on the same line with the Sun.

Types

- inferior conjunction
- superior conjunction



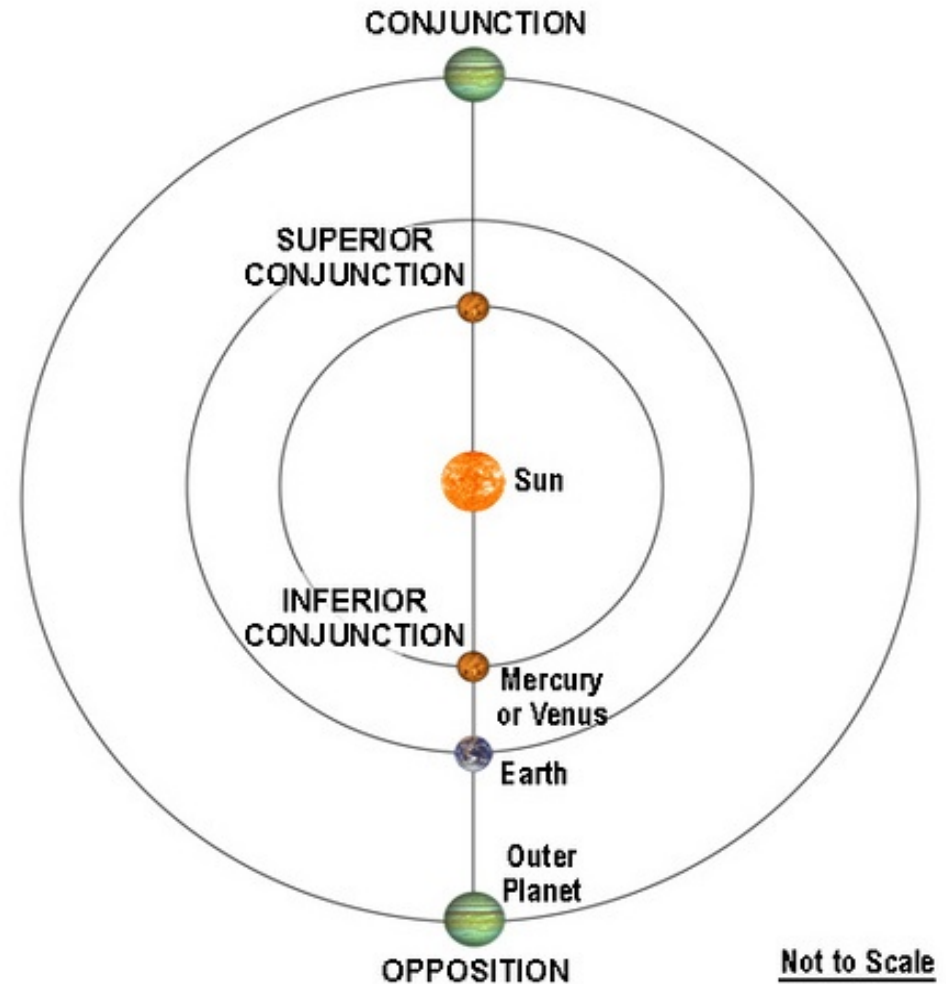
Conjunction

Conjunction

- occur when two planets are on the same line with the Sun.

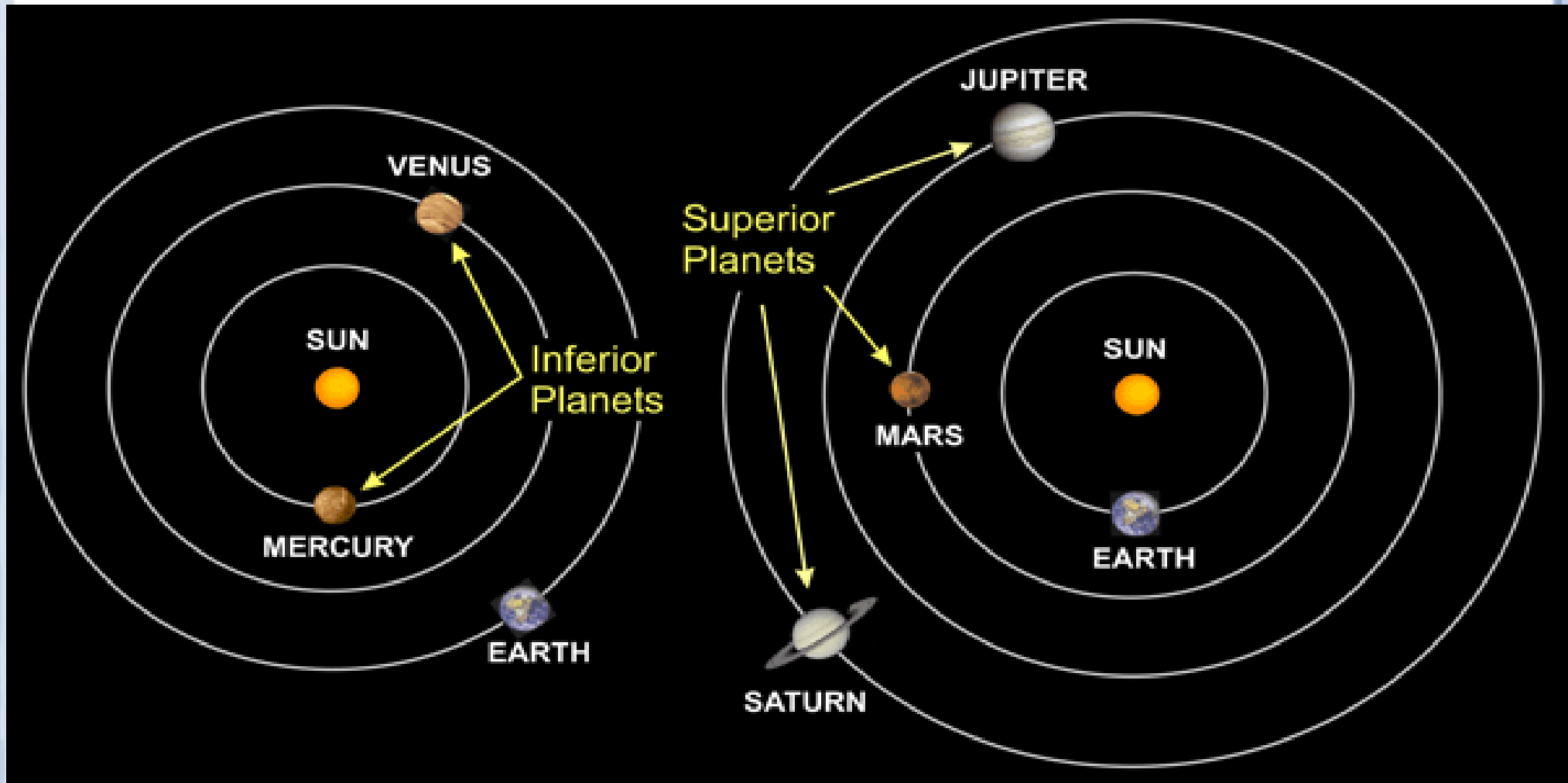
Types

- inferior conjunction
- superior conjunction



Conjunction

Inferior & Superior

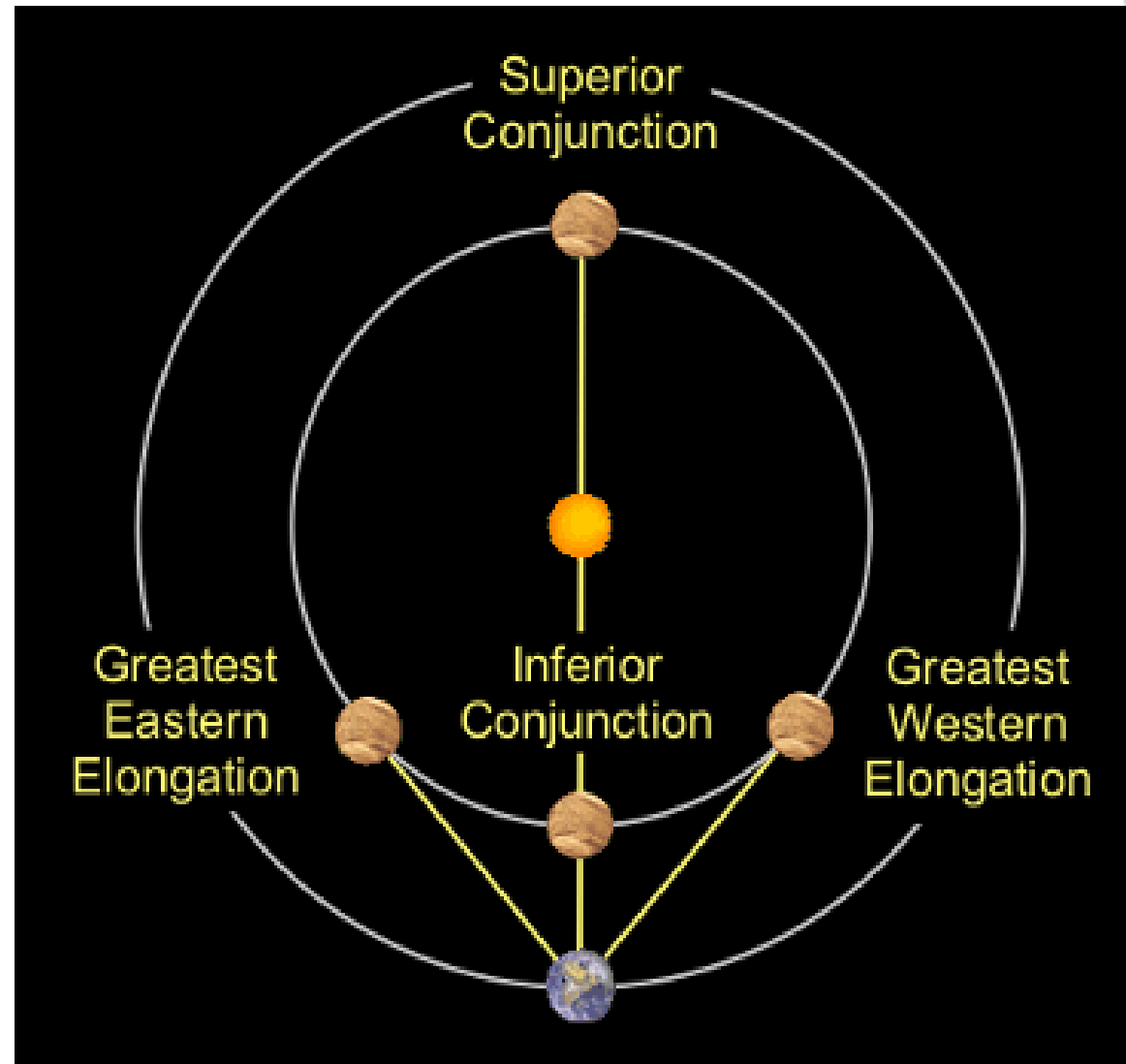


Describes the position of the planet with respect to the Earth. Inner = Inferior and Outer = Superior

Conjunction

Inferior Conjunction

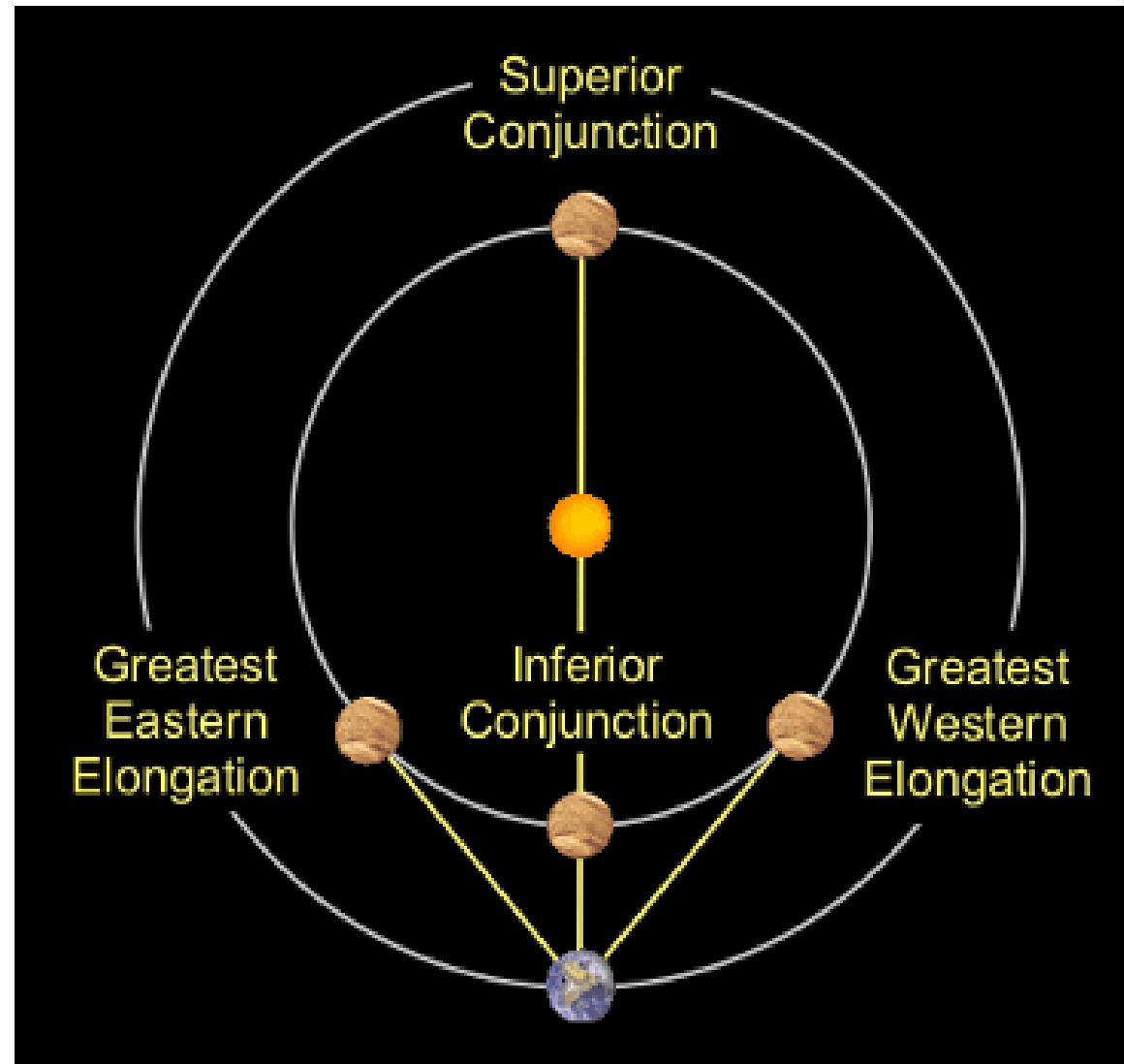
occurs when the planet passes between the Earth and the Sun
>> always true for inner planets



Conjunction

Superior Conjunction

occurs when the Earth is between the planet and the Sun >> always true for outer planets



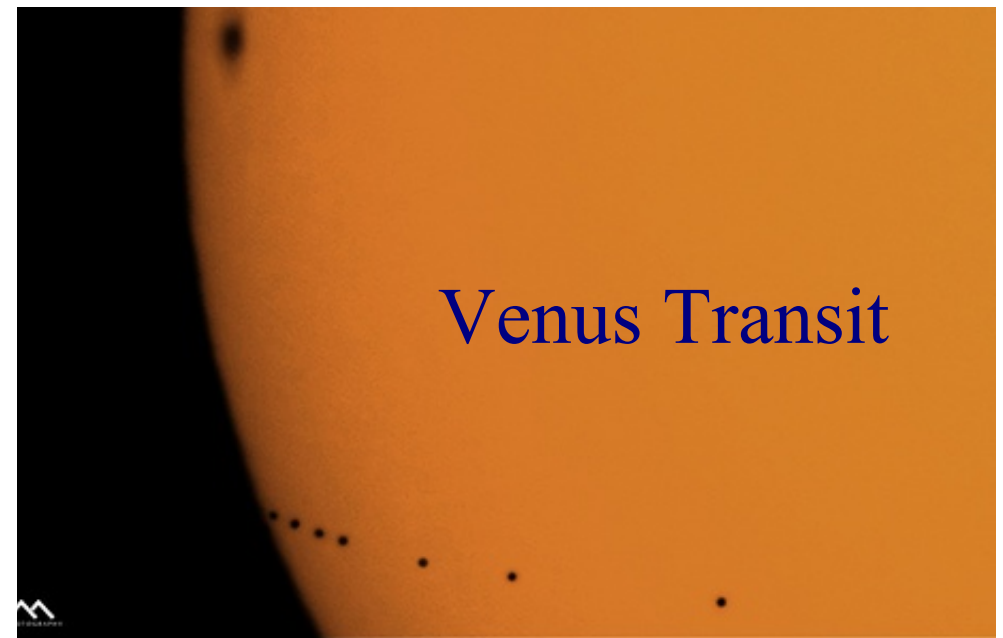
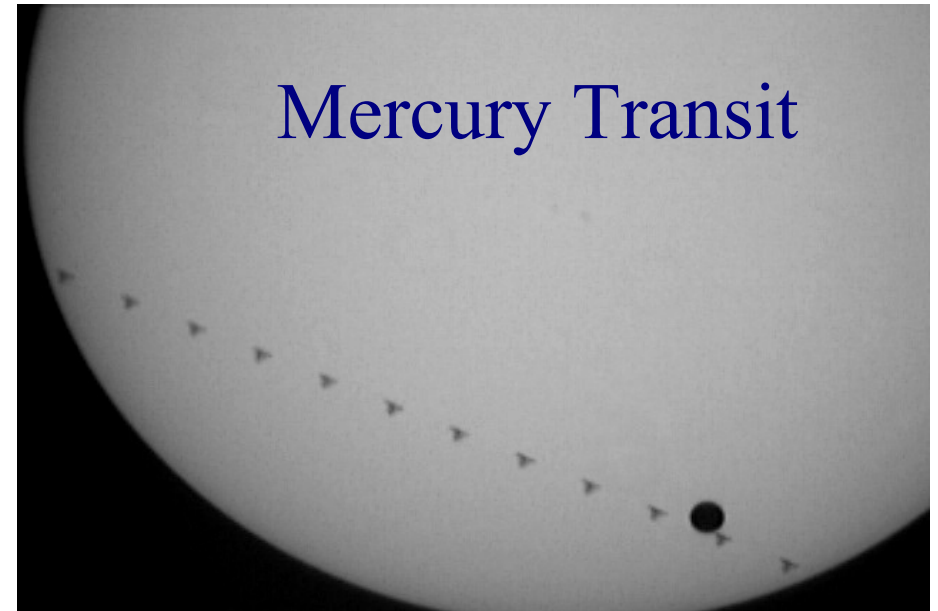
Astronomical Phenomena

Transit

Transit

- occur when the planets passes in front of the Sun and appear as a black moving dot on the solar disc.

- occur for inferior planets; Mercury and Venus



Astronomical Phenomena

Meteor Showers

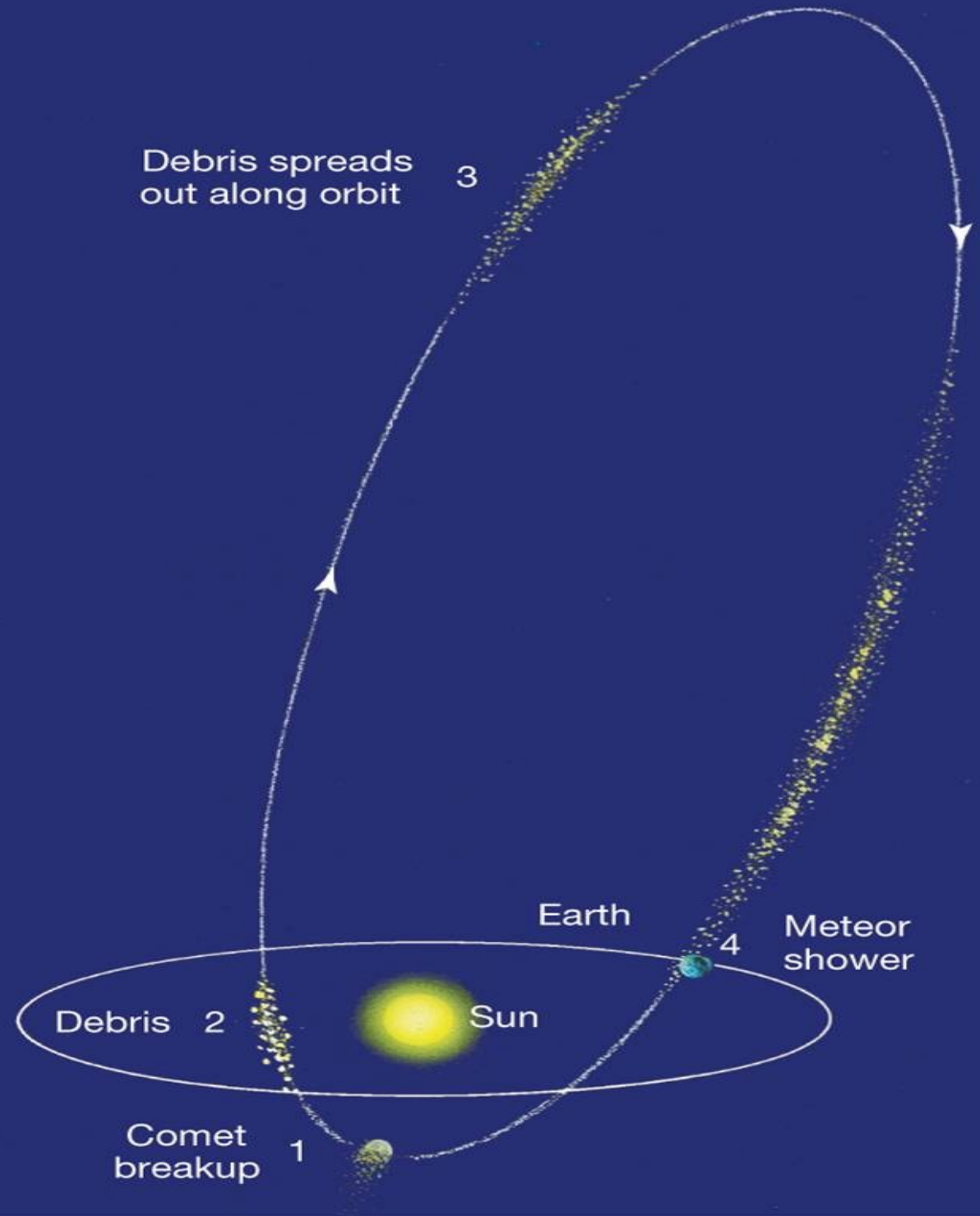
Meteor Shower

- happens when a number of meteors are observed to radiate from one point in the night sky.
- caused by streams of cosmic debris called meteoroids entering Earth's atmosphere at extremely high speeds on parallel trajectories.



Astronomical Phenomena

Meteor Shower



Greetings from
Somewhere in the

HALLEY'S COMET



