

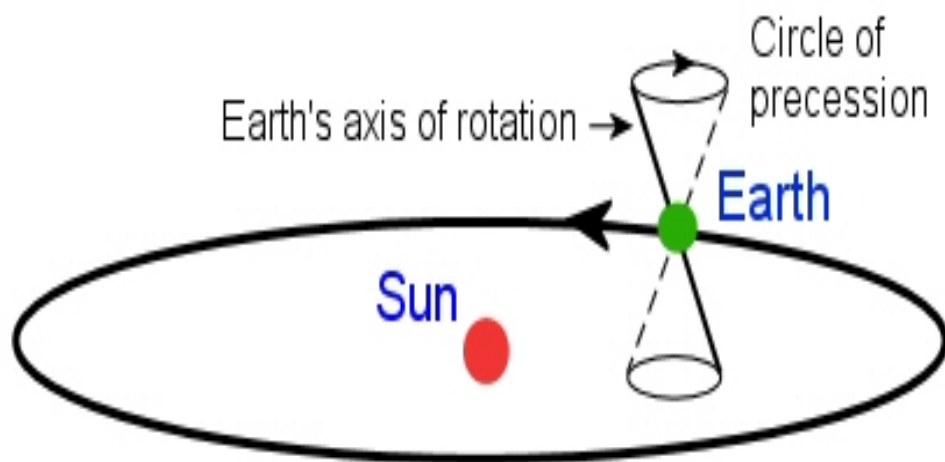
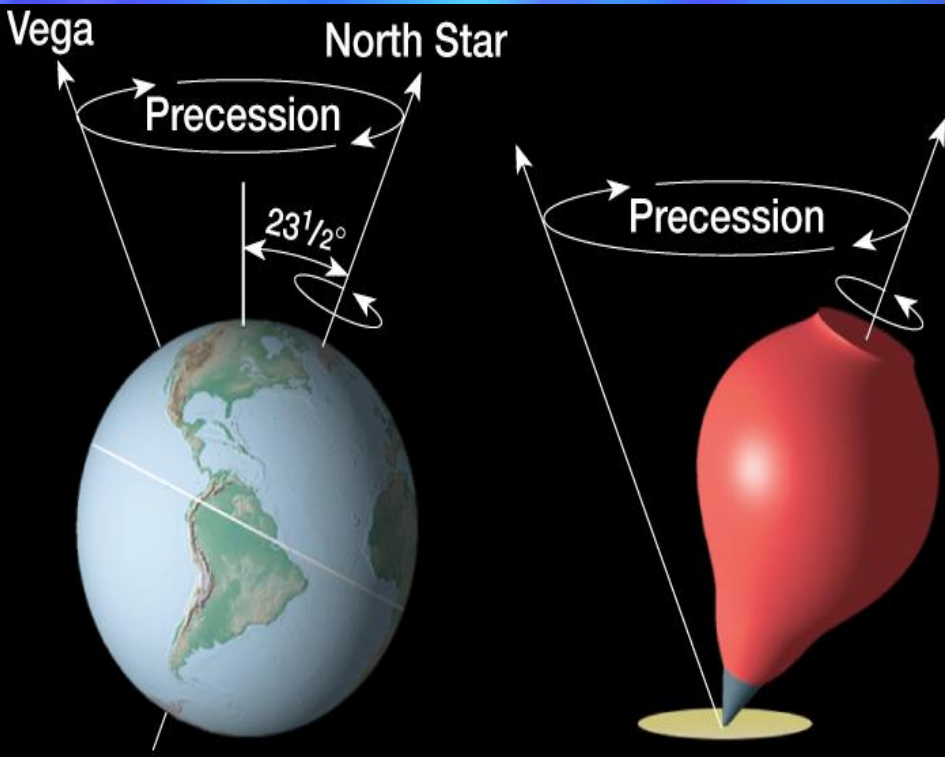


Earth Motions Pt 2
Birth of Universe &
Solar System

Unit 10 – Ch 23

Earth's Motions

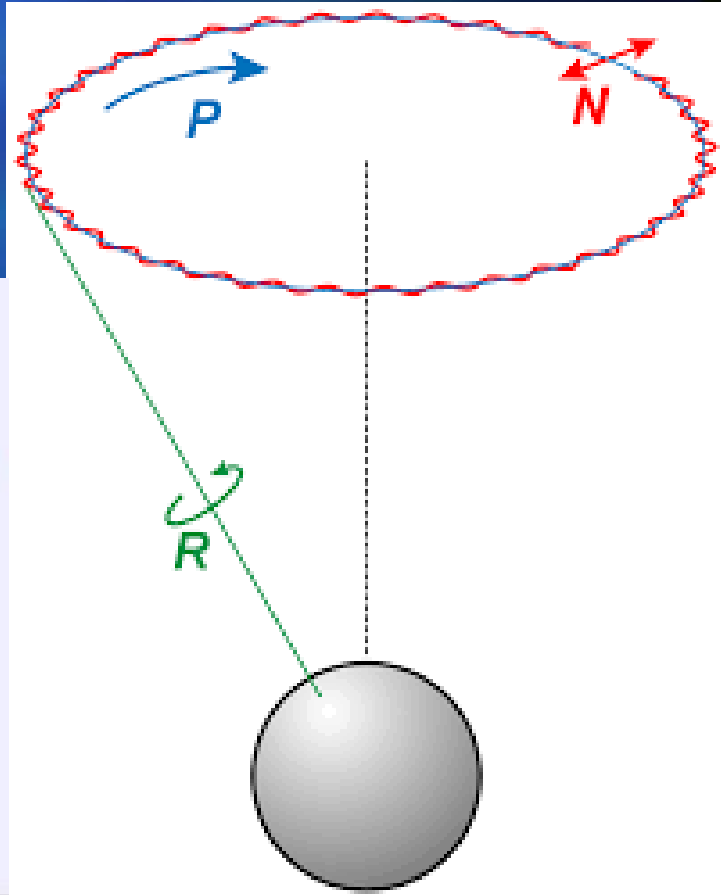
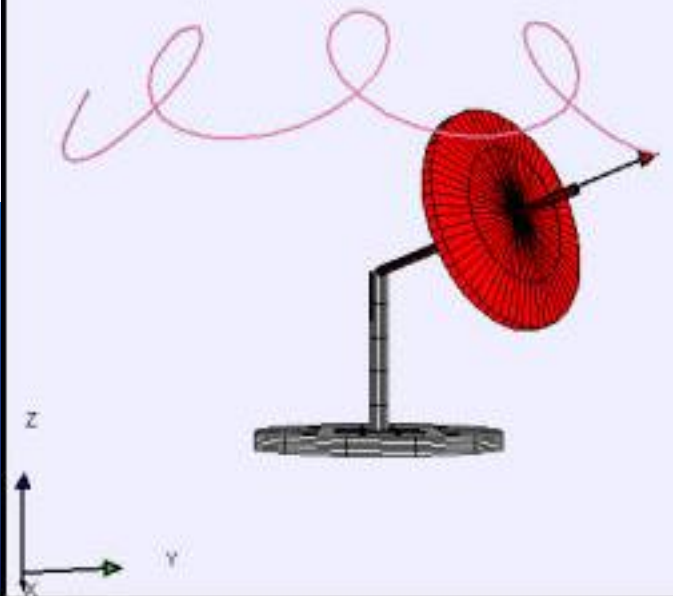
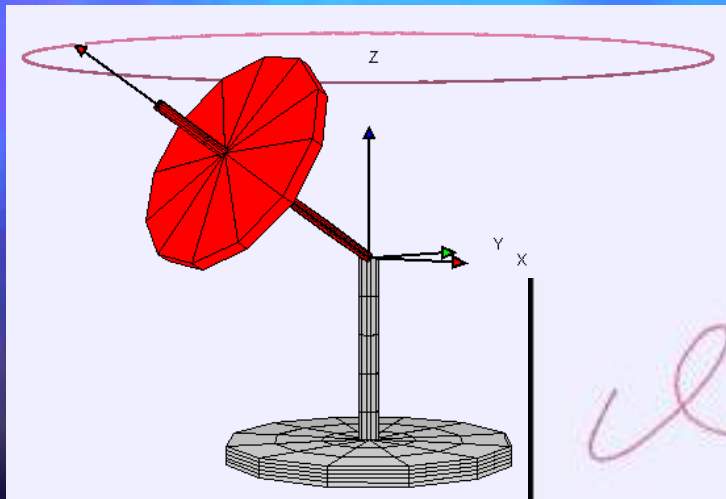
- **PRECESSION**: *Slow, continuous, clockwise rotation* of Earth's axis AS Earth rotates (C-C)
 - Changes *direction* of axis – 26,000 year cycle



As the earth orbits the sun, it also slowly wobbles. When viewed from above, the earth's orbit is counterclockwise but the direction of precession is clockwise.

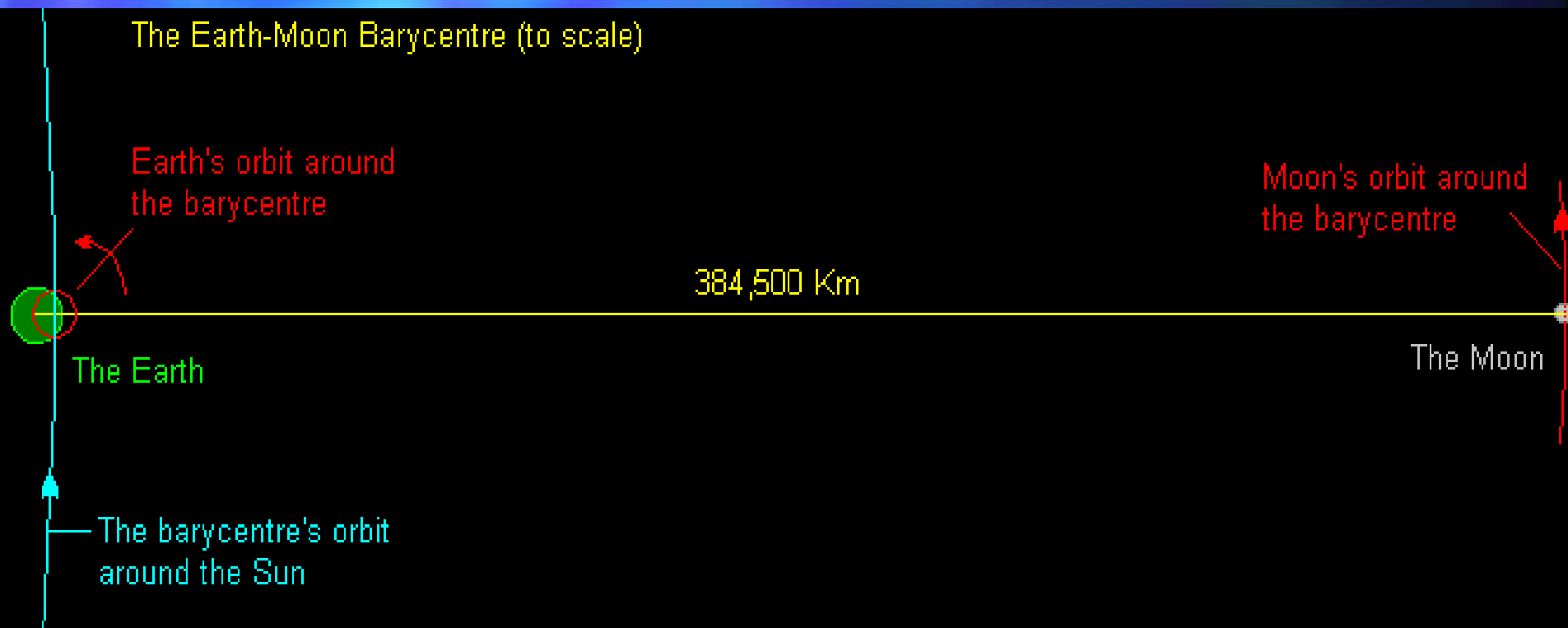
Earth's Motions

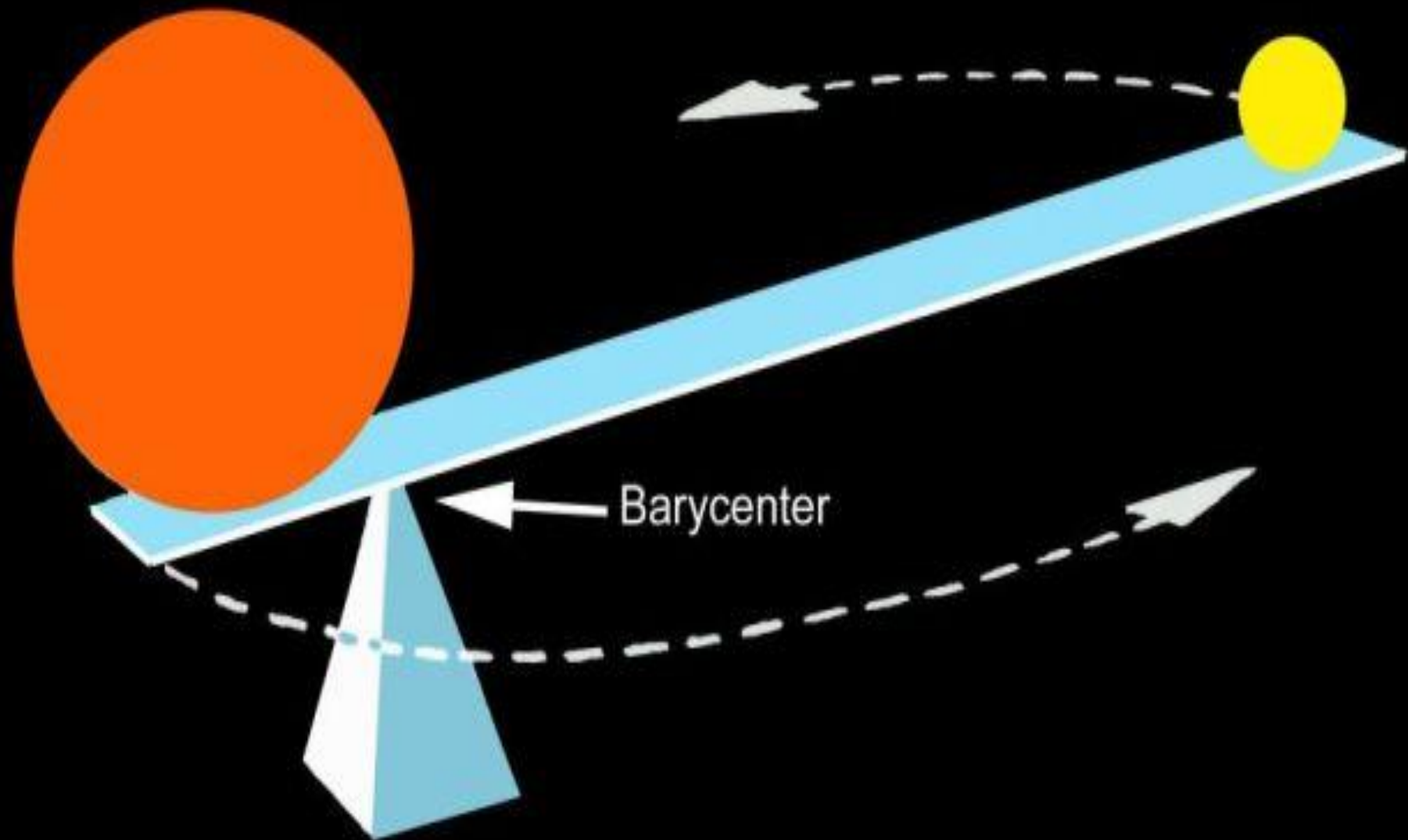
□ **NUTATION**: **Wobbling** or **swaying** motion of Earth's rotational *axis* **DURING** *precession*



Earth's Motions

□ **BARYCENTER**: *Center* of mass between two objects as they **orbit** one another and balance each other → *Earth-Moon: ~1000 miles beneath Earth surface*





Formation of Universe & Solar System

Formation of Universe

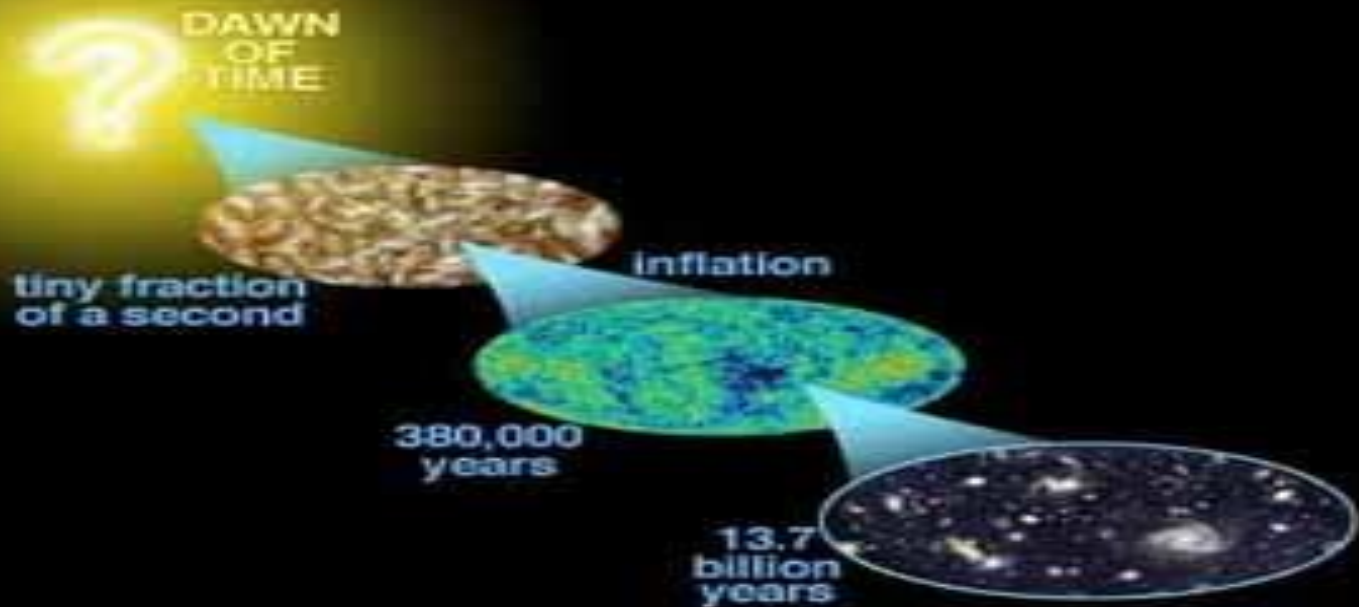
- ◆ **BIG BANG THEORY**: Explains how *universe* developed from very tiny, dense “**singularity**” then **exploded**



B I G B A N G T H E O R Y
In the Beginning There Was Nothing.....
Which Exploded

Formation of Universe

- ◆ **BIG BANG THEORY**: Does **NOT** entirely explain what **initiated** creation of universe
 - Only describes **expansion** of universe



THE BIG BANG

INFLATION

GALAXY EVOLUTION

CONTINUES...

DARK ENERGY ?

FIRST STARS
400,000,000 YEARS
AFTER BIG BANG

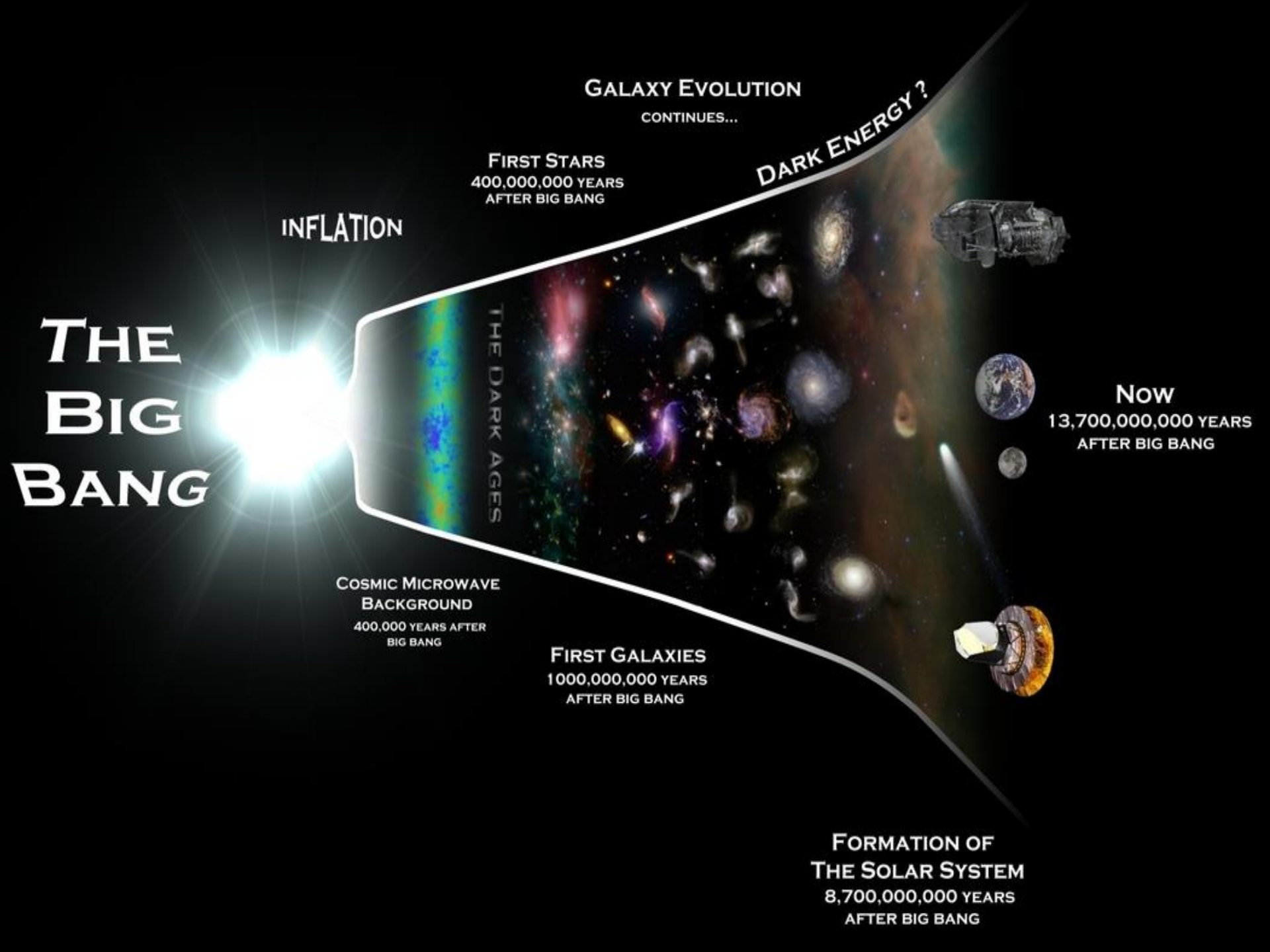
THE DARK AGES

COSMIC MICROWAVE
BACKGROUND
400,000 YEARS AFTER
BIG BANG

FIRST GALAXIES
1,000,000,000 YEARS
AFTER BIG BANG

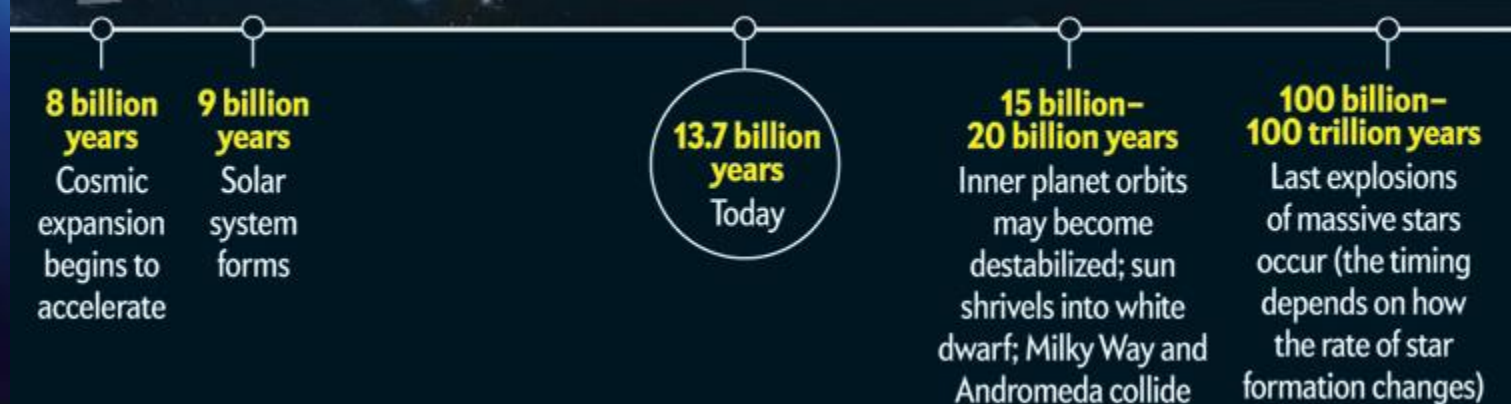
FORMATION OF
THE SOLAR SYSTEM
8,700,000,000 YEARS
AFTER BIG BANG

Now
13,700,000,000 YEARS
AFTER BIG BANG



Formation of Universe

- ◆ **BIG BANG THEORY**: According to BBT, **UNIVERSE** is **13.7 Billion years old**



Formation of Solar System

- ◆ NEBULAR THEORY: **SOLAR SYSTEM** formed from **contraction** of huge, rotating **cloud** of **dust** and **gases** due to gravity → **Age = ~4.6-5 billion**



Universe is EXPANDING

■ Evidences?

- Cosmic Background Radiation – *Low temp* waves of original waves indicating **explosion** occurred
- Gravity – Responsible for movement of **dust** clouds (*nebula*) to form *planets, stars, solar systems, galaxies*