



GEOGRAPHY

Earth, Solar System And Universe

Shape of earth

Latitudes & Longitudes

Rotation & Revolution

Seasons

Time zones and IDL

Universe and Origin of universe

Life cycle of a star

Galaxies and stars

Origin of solar system

Sun

Planets, satellites and other bodies

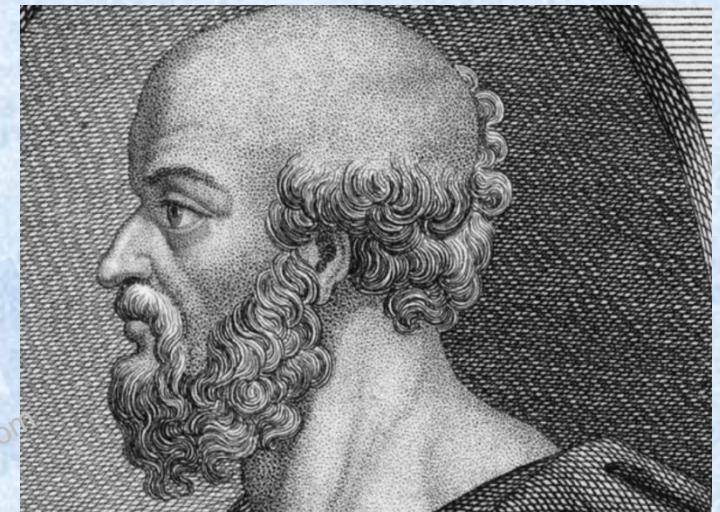
Eclipses

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What is Geography?



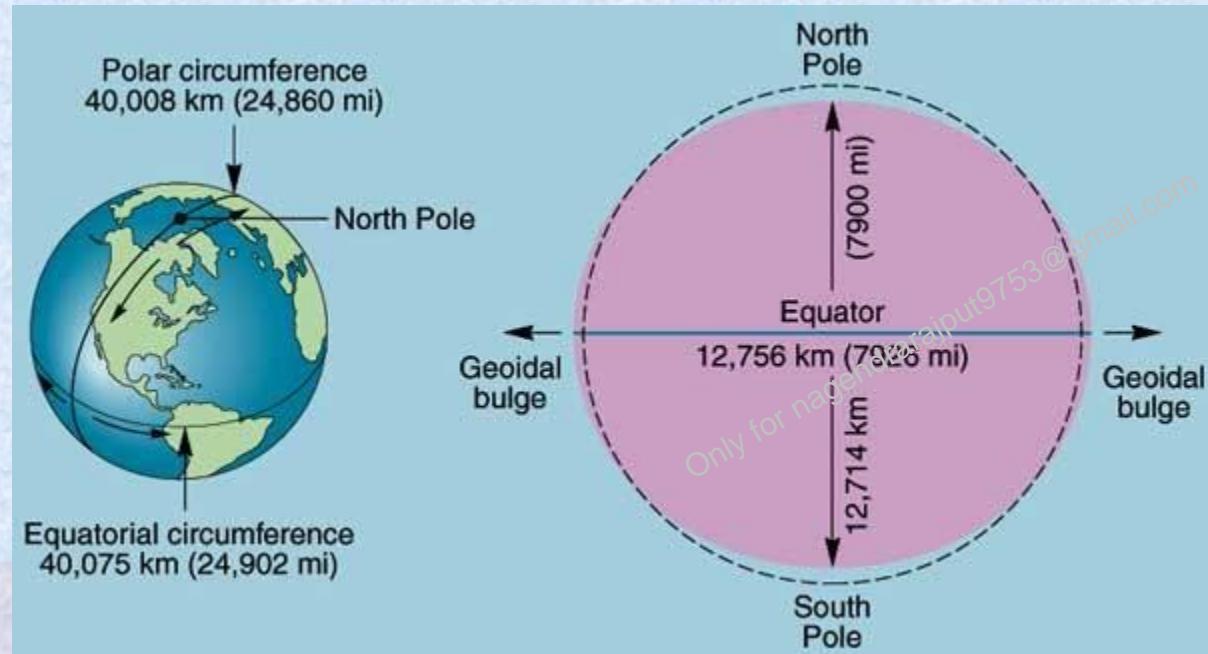
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Erasthenes

Father of Geography

Shape of the Earth



Geoid

Shape of the Earth

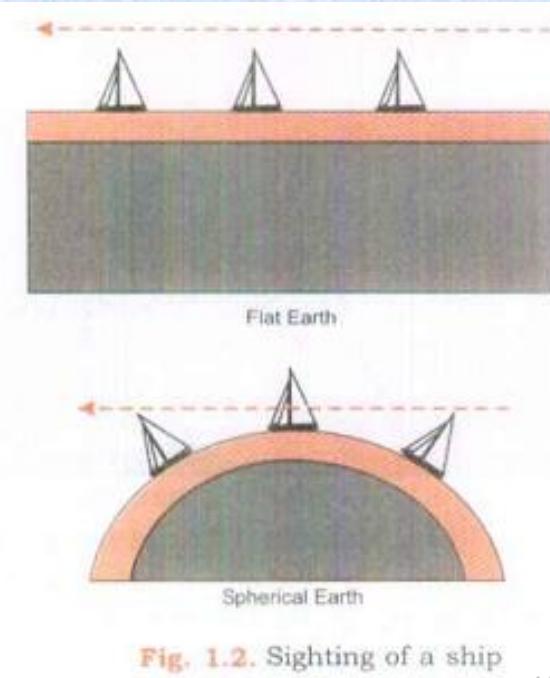
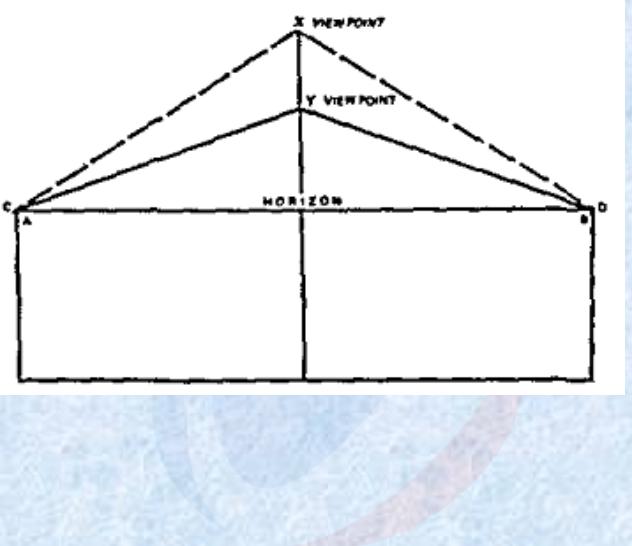
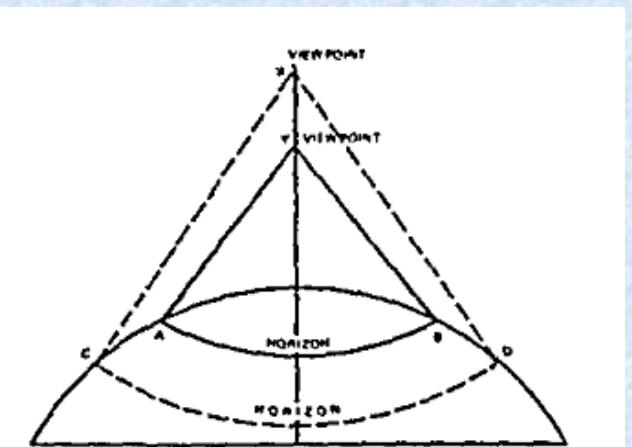


Fig. 1.2. Sighting of a ship

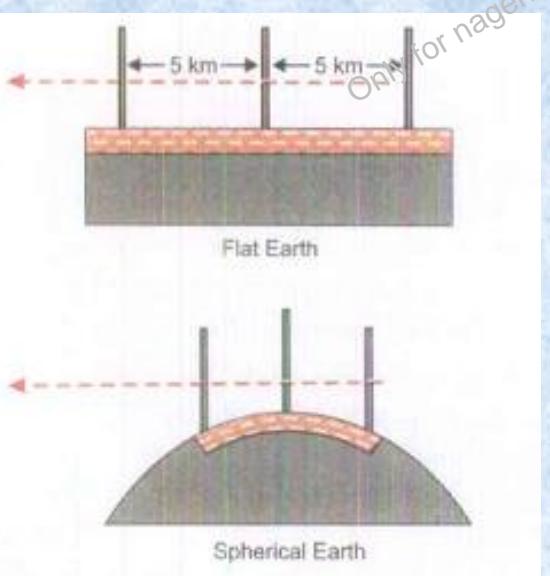
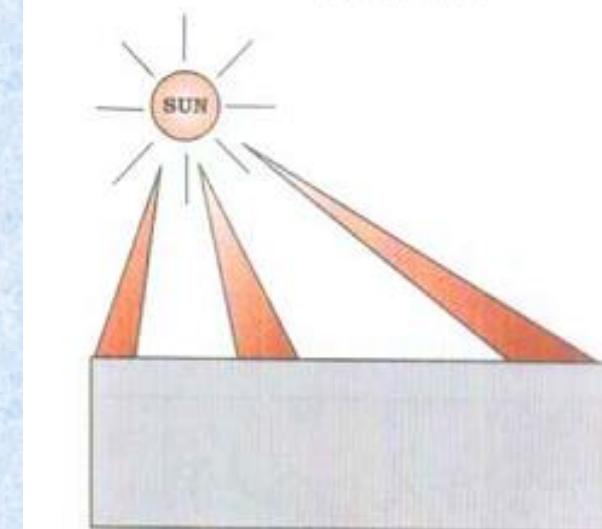
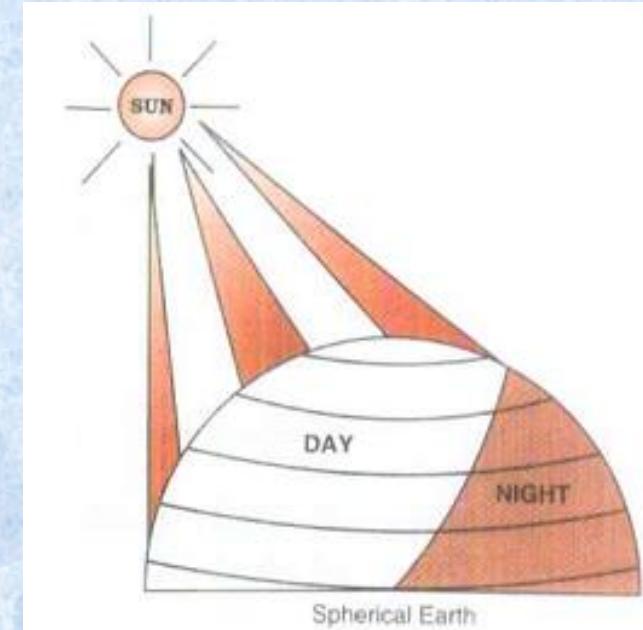
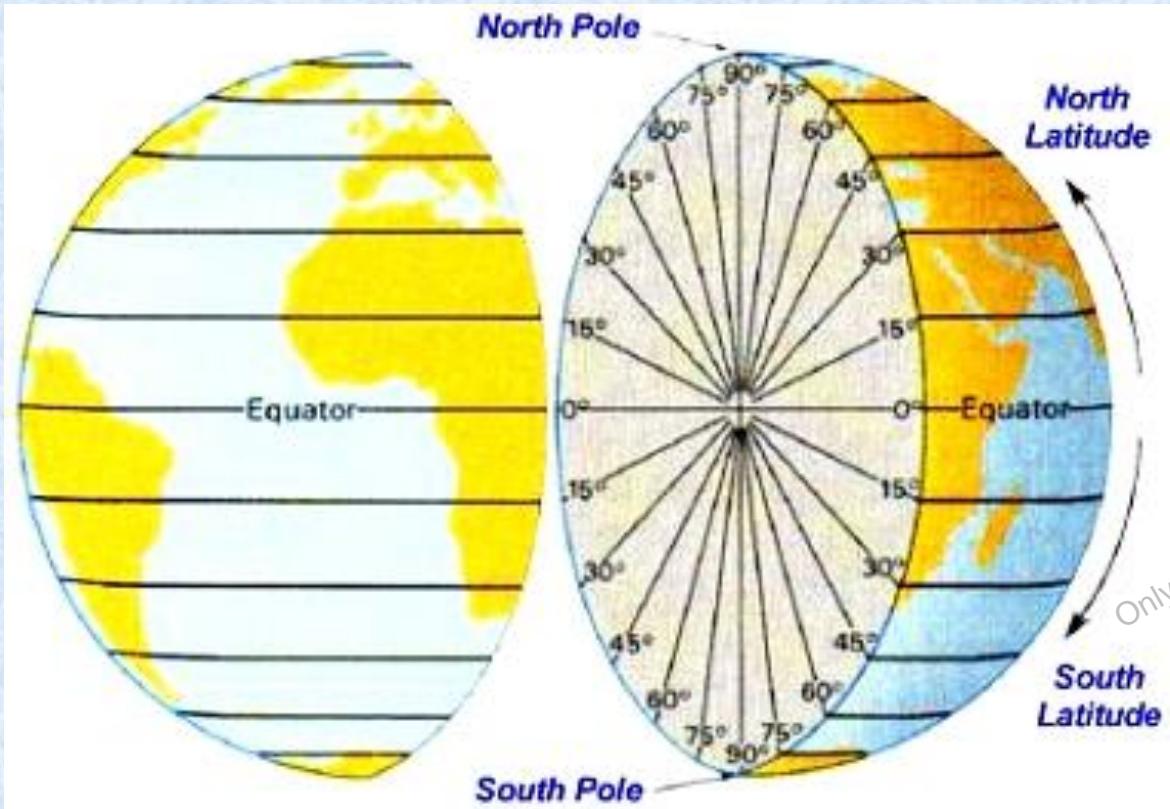


Fig. 1.3. Bedford level experiment



g. 1.8. Sunrise and Sunset occurs at different times at different places

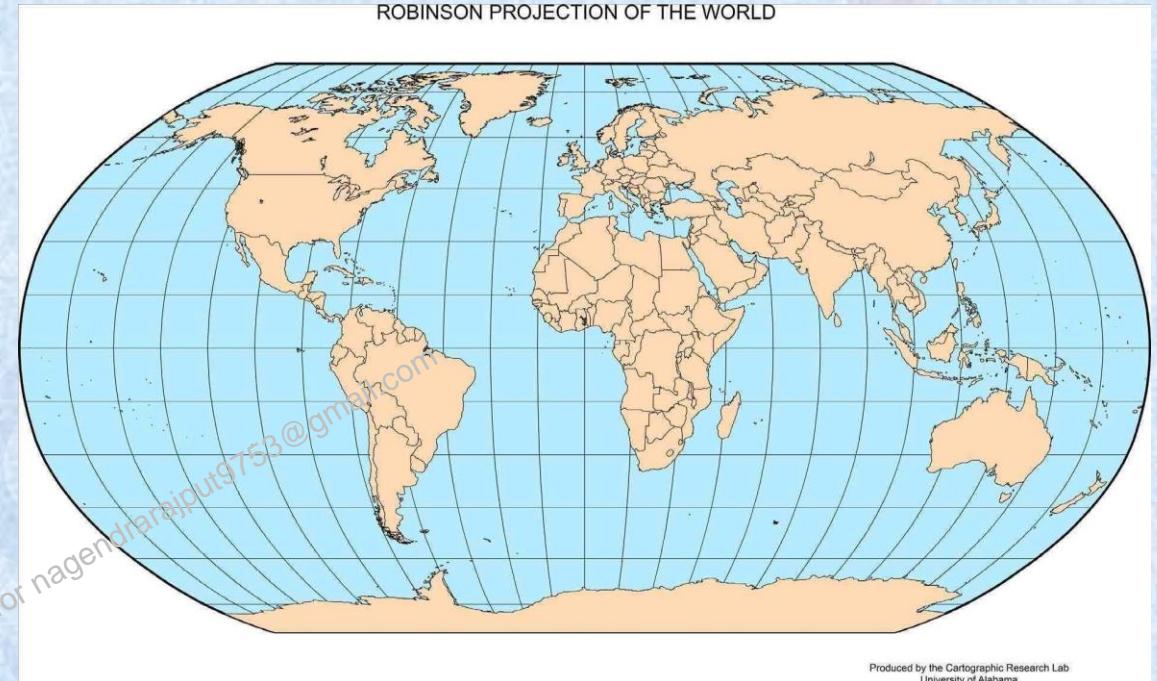
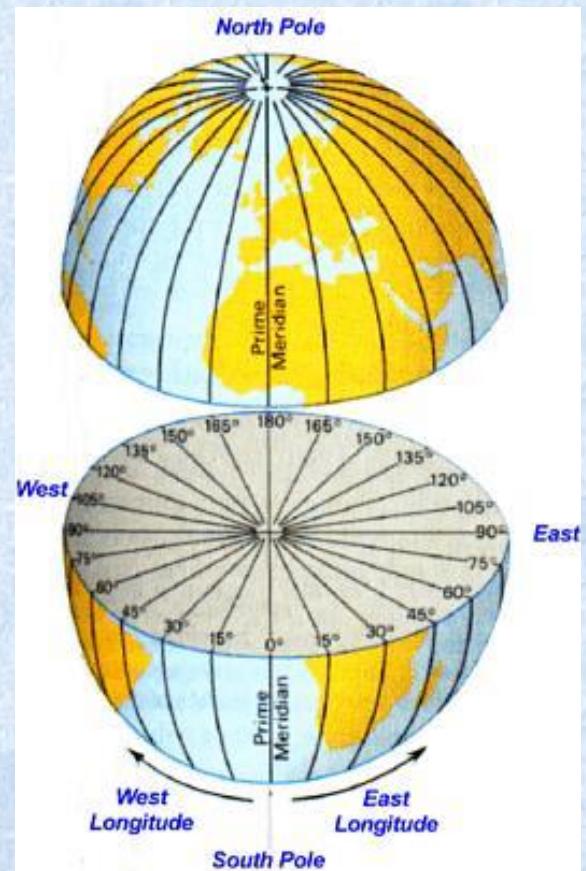
Latitudes and Longitudes

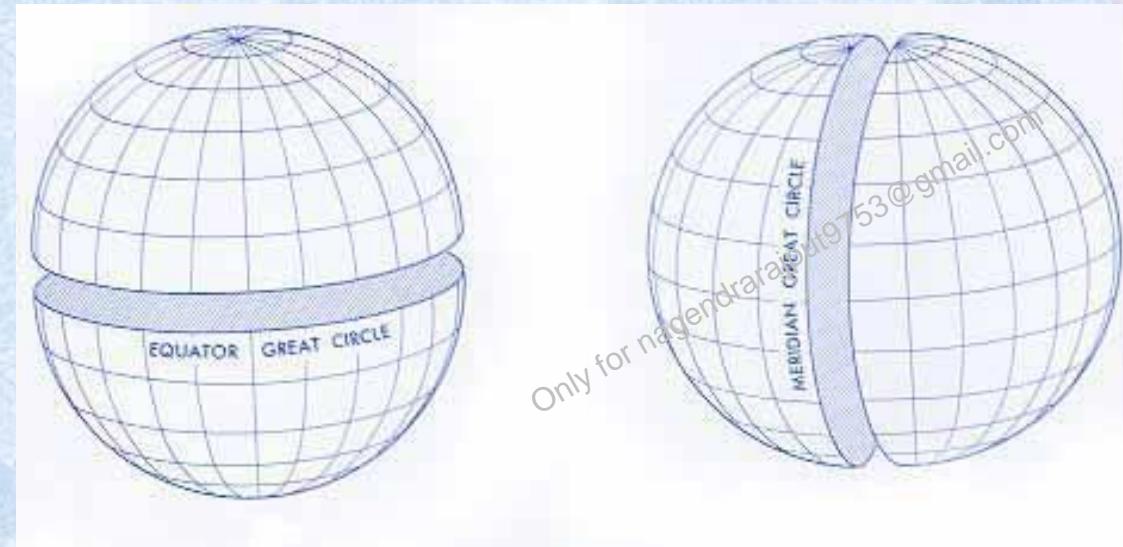


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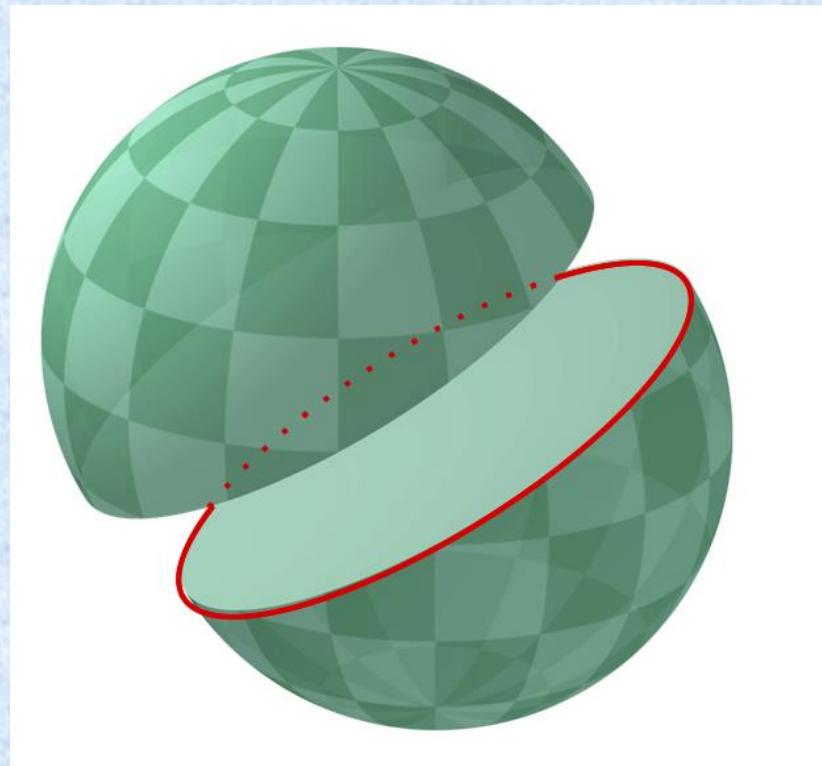
Latitudes and Longitudes



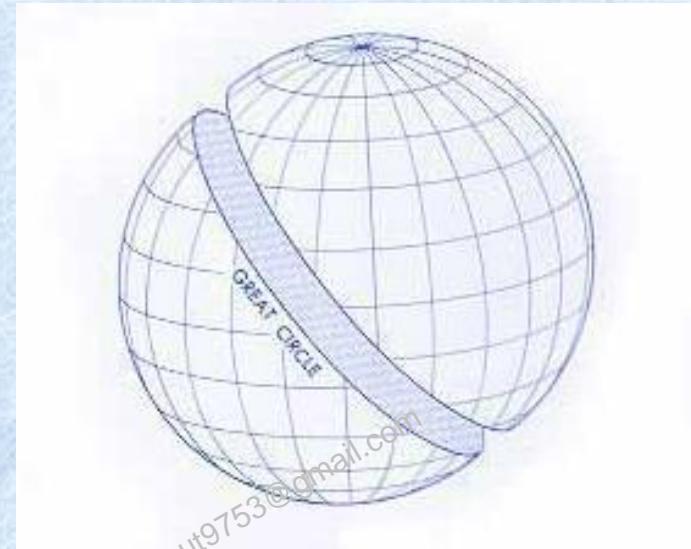
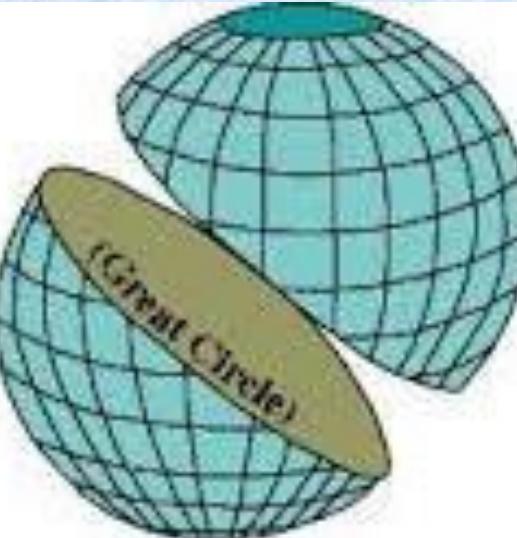


Great Circle

Latitudes and Longitudes



Great Circle

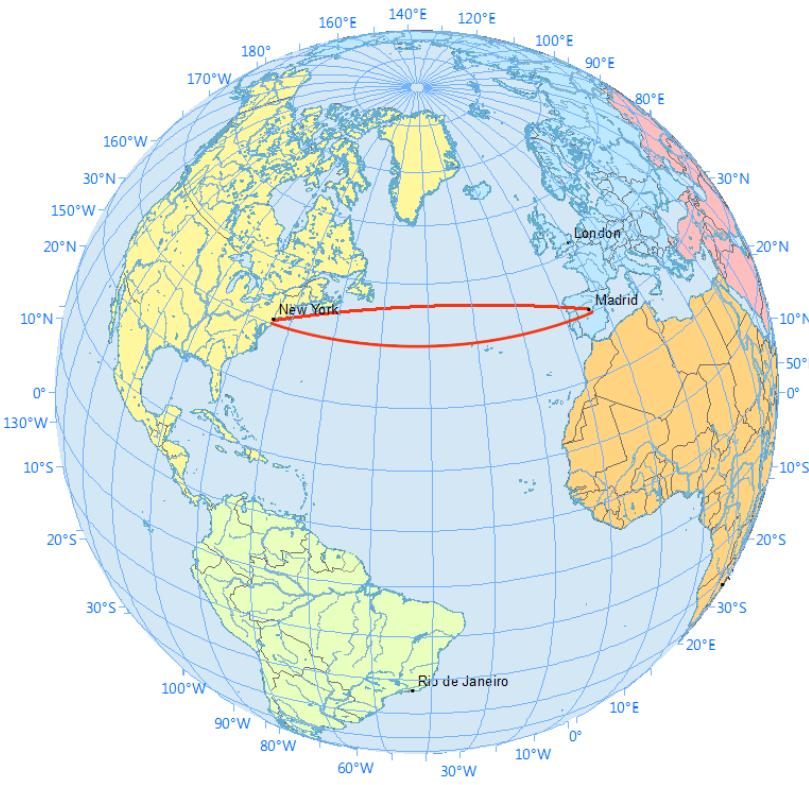


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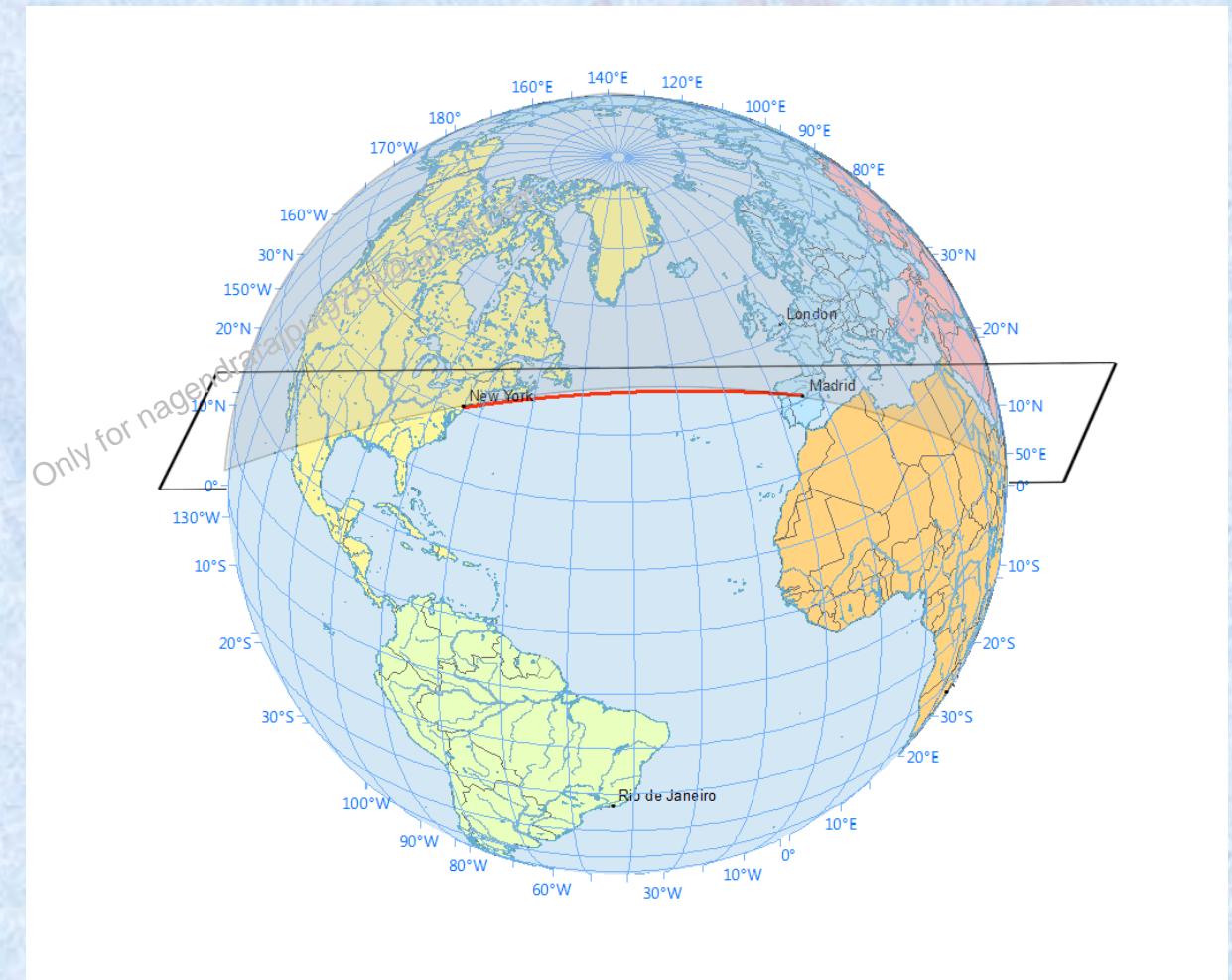
Latitudes and Longitudes

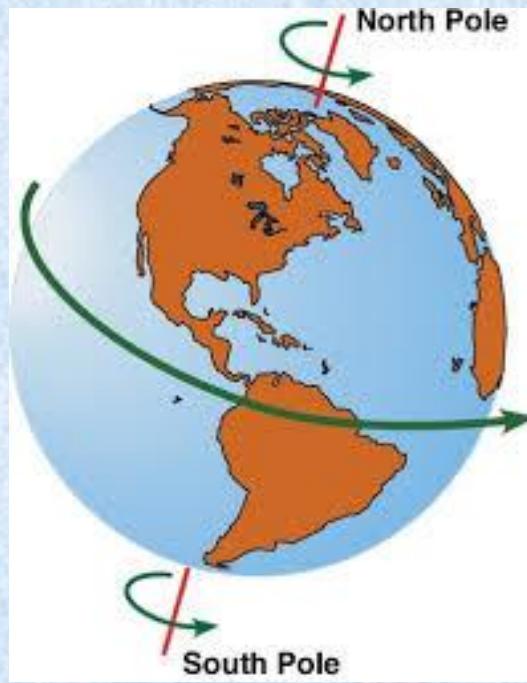


Latitudes and Longitudes

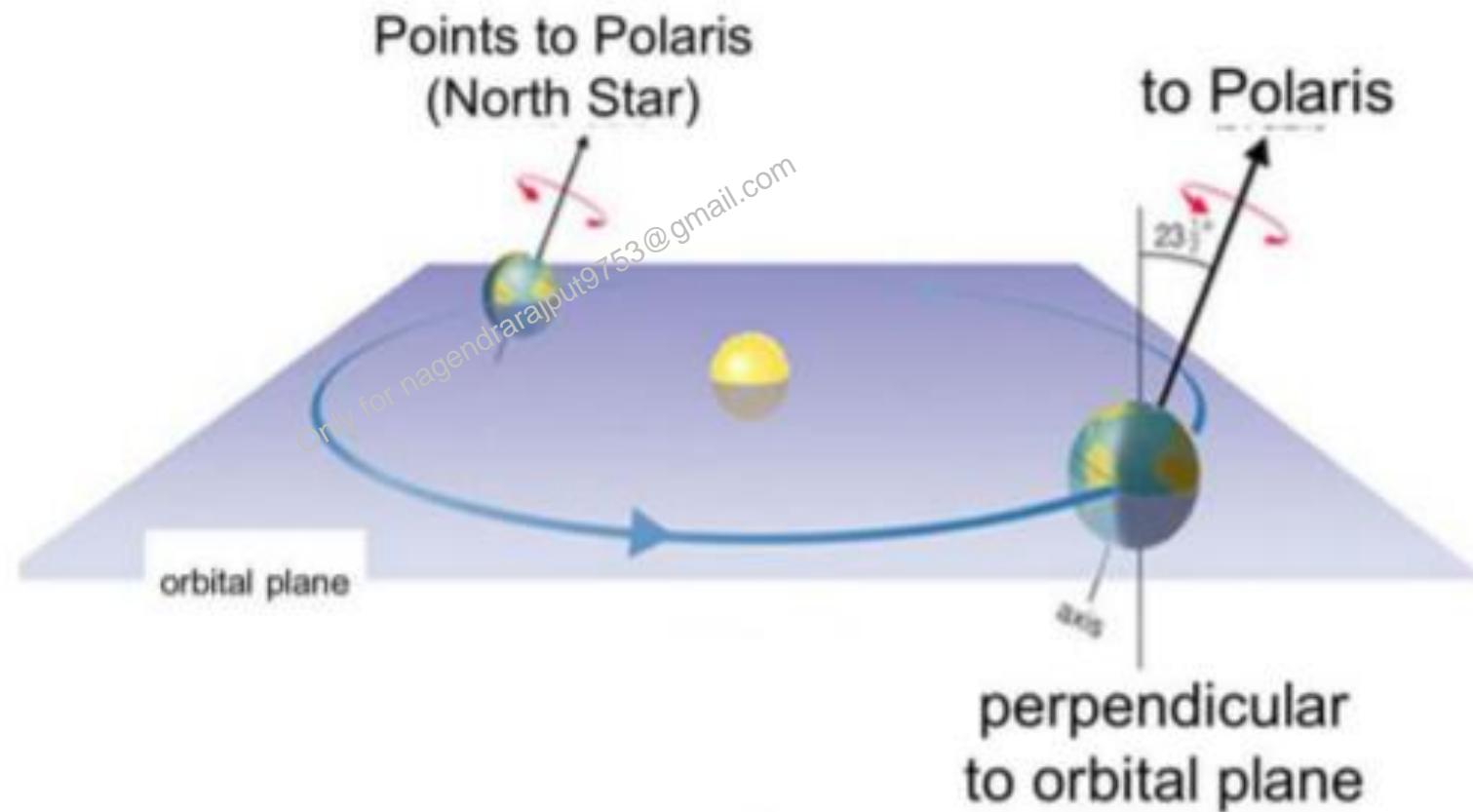


Great Circle in
measuring shortest
distance

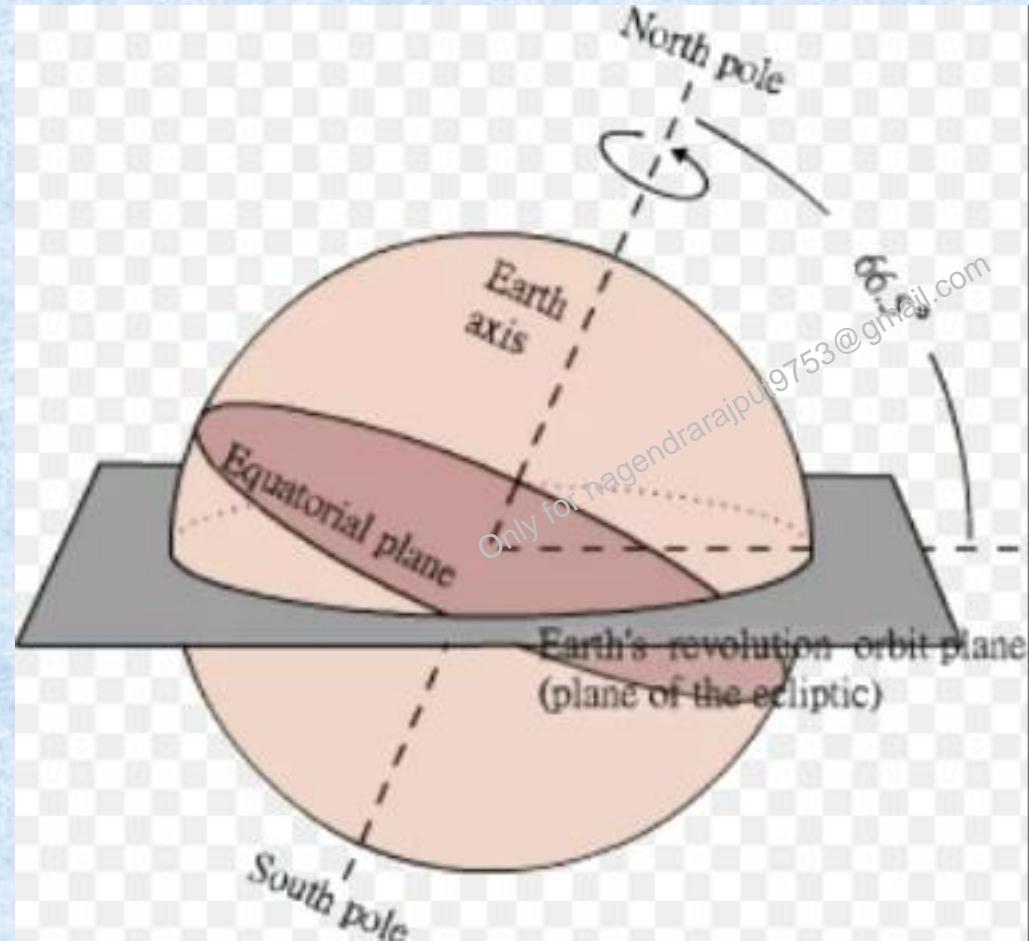




Earth's Orbital Plane

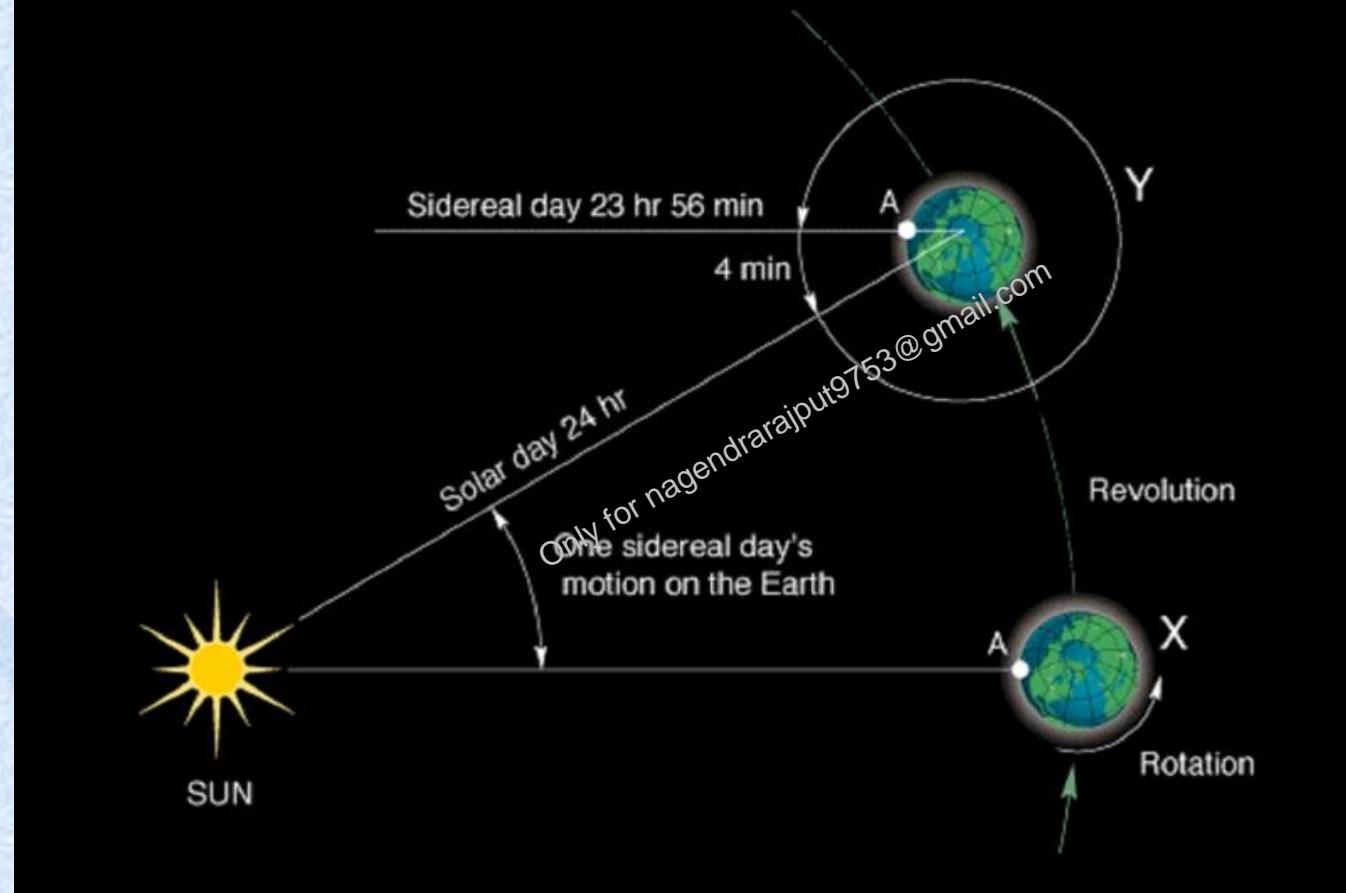


Axis of rotation and Orbital plane



Axis of rotation and Orbital plane

Sidereal Day vs. Solar Day



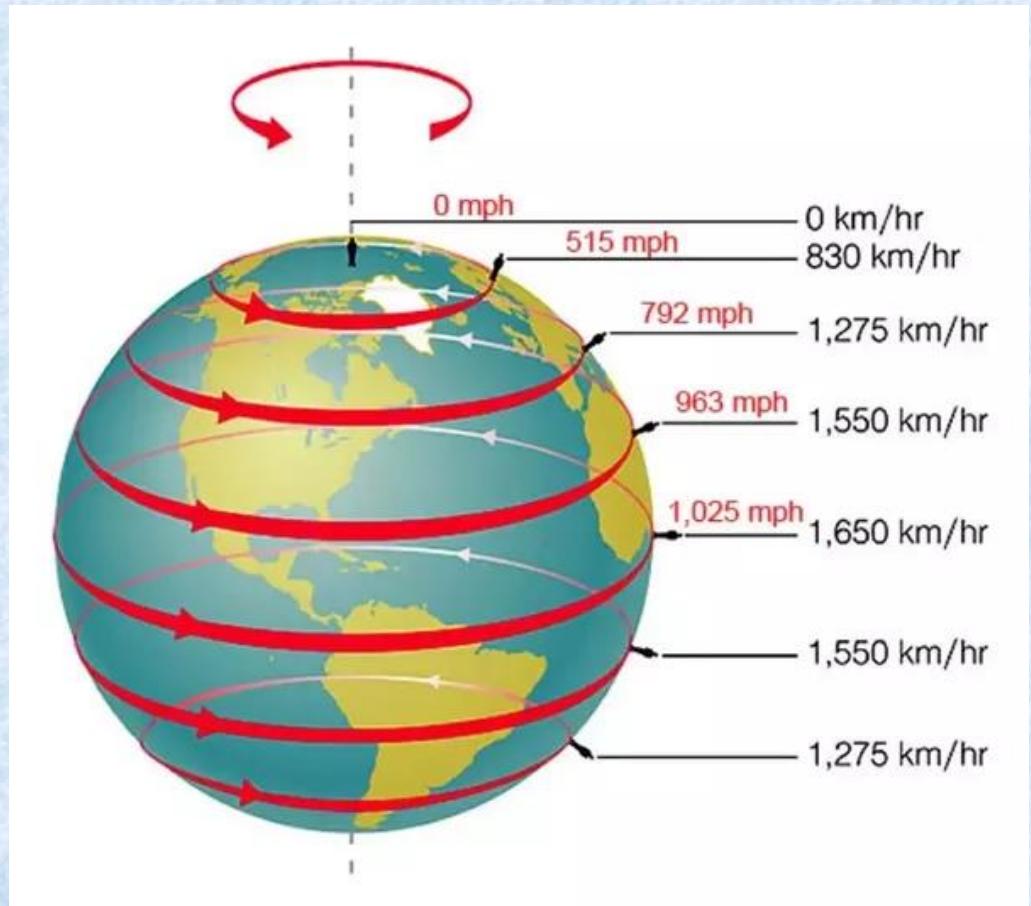
Solar day & Sidereal day

<https://www.youtube.com/watch?v=1wGFJd3j3ds>

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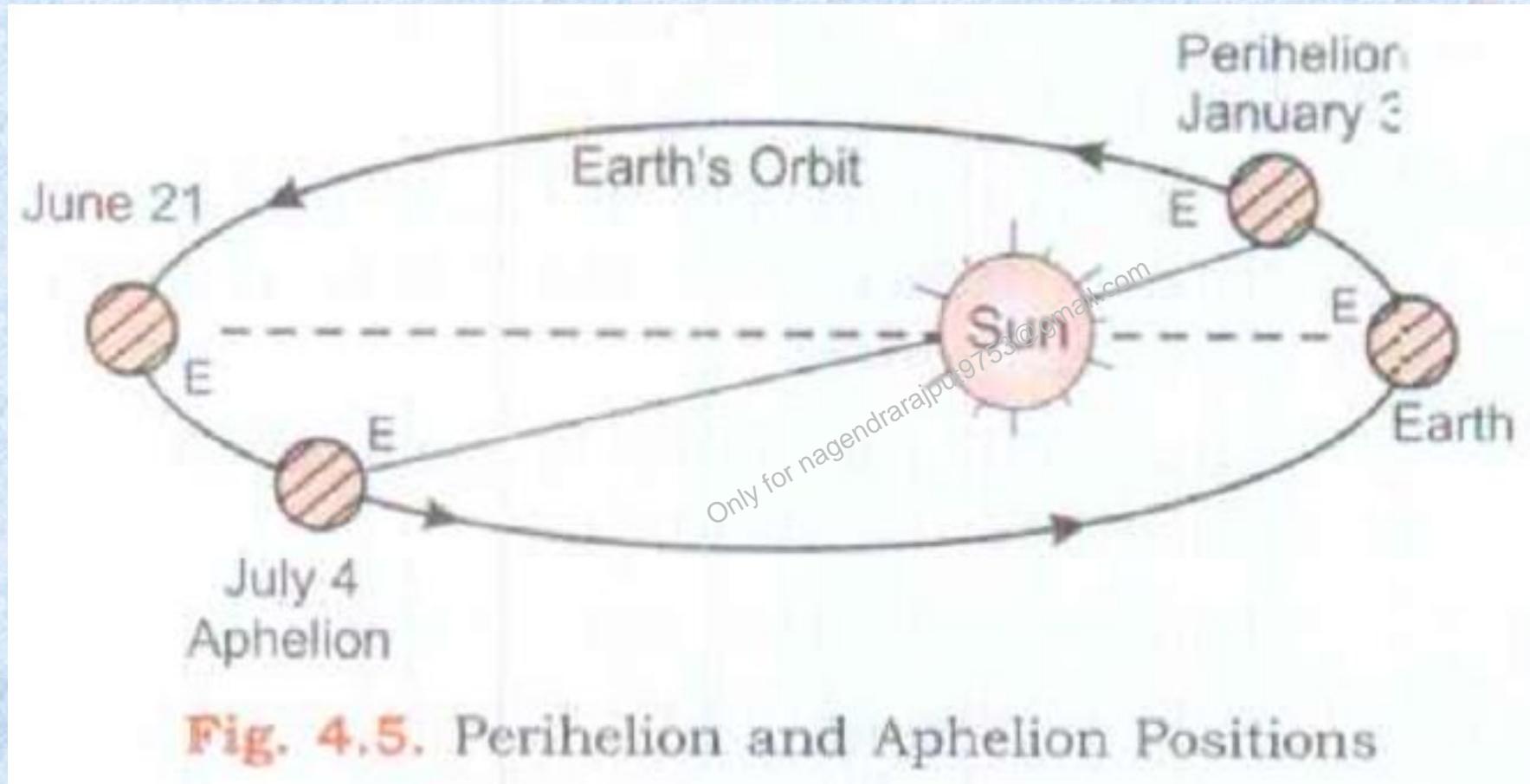
Solar day & Sidereal day

Rotation and Revolution



Linear speed of rotation





Revolution of Earth

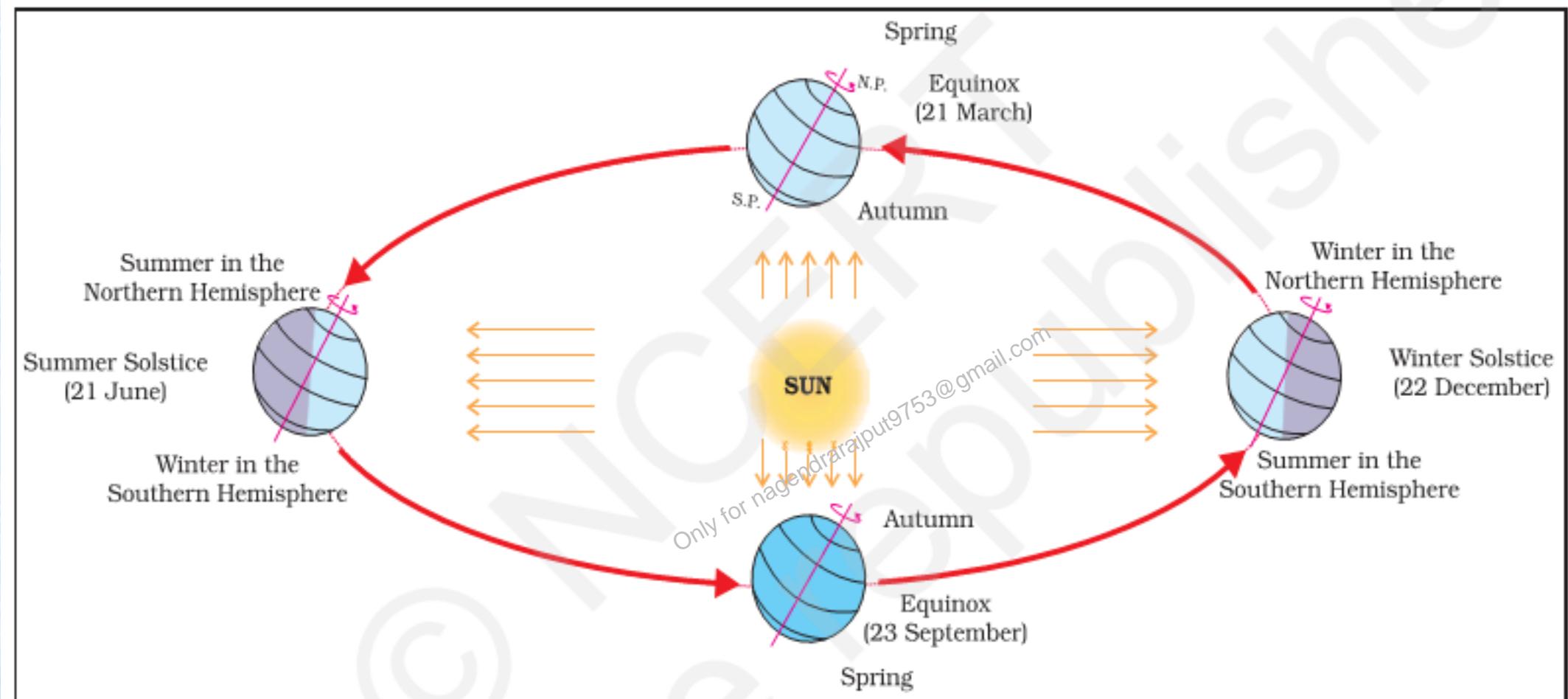
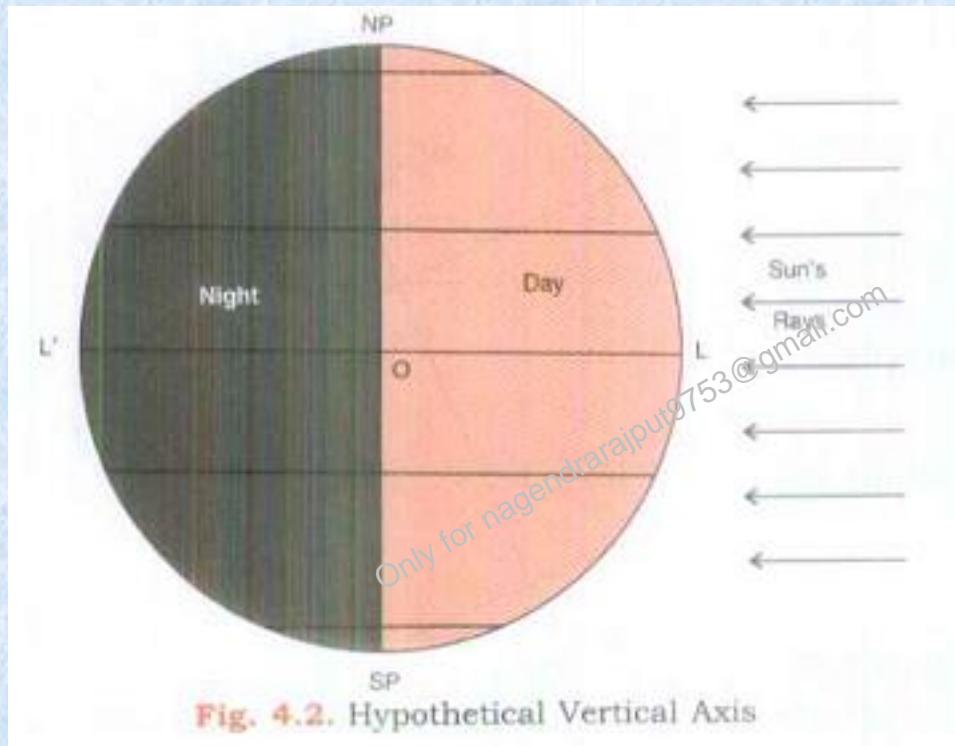


Figure 3.3 : Revolution of the Earth and Seasons

Revolution with constant
tilted axis



Circle of illumination

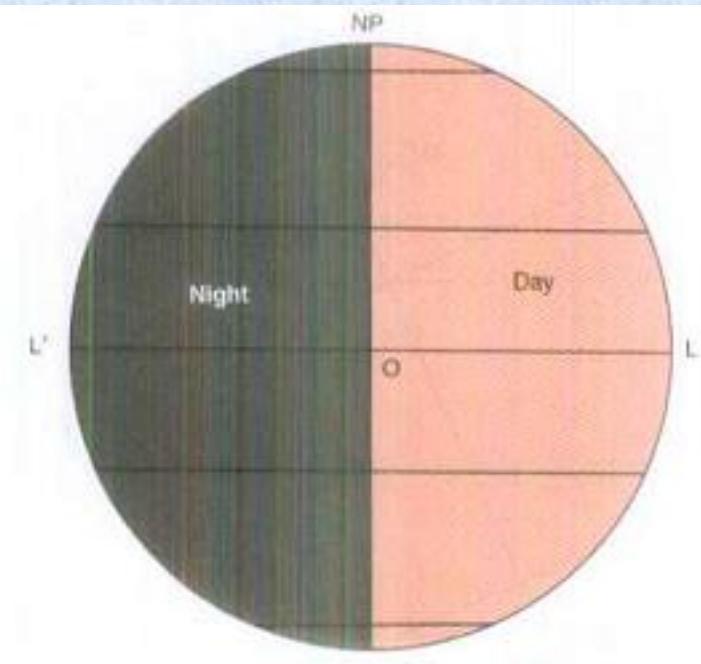


Fig. 4.2. Hypothetical Vertical Axis

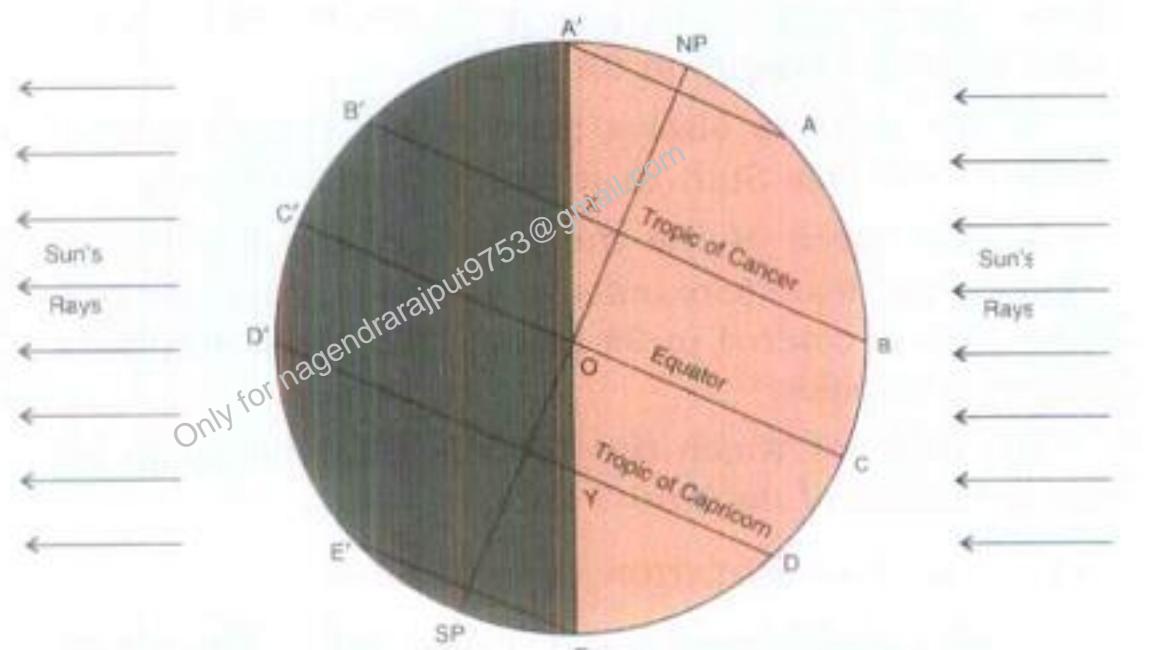
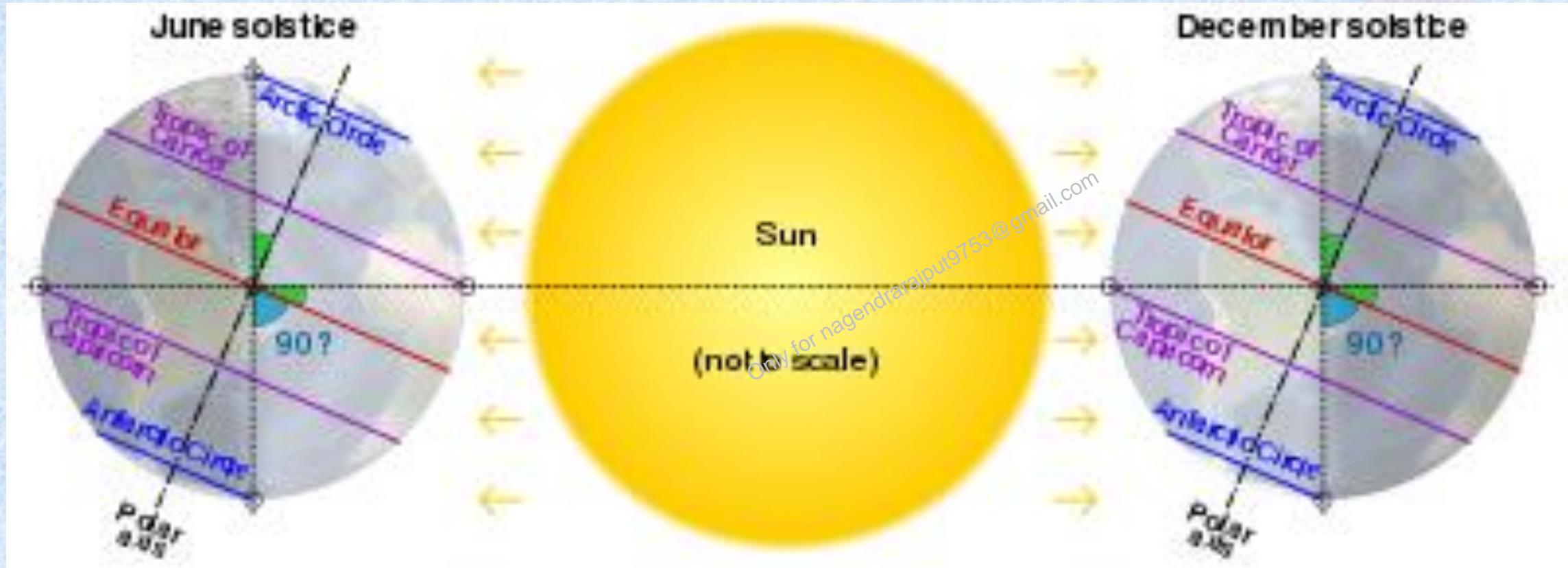


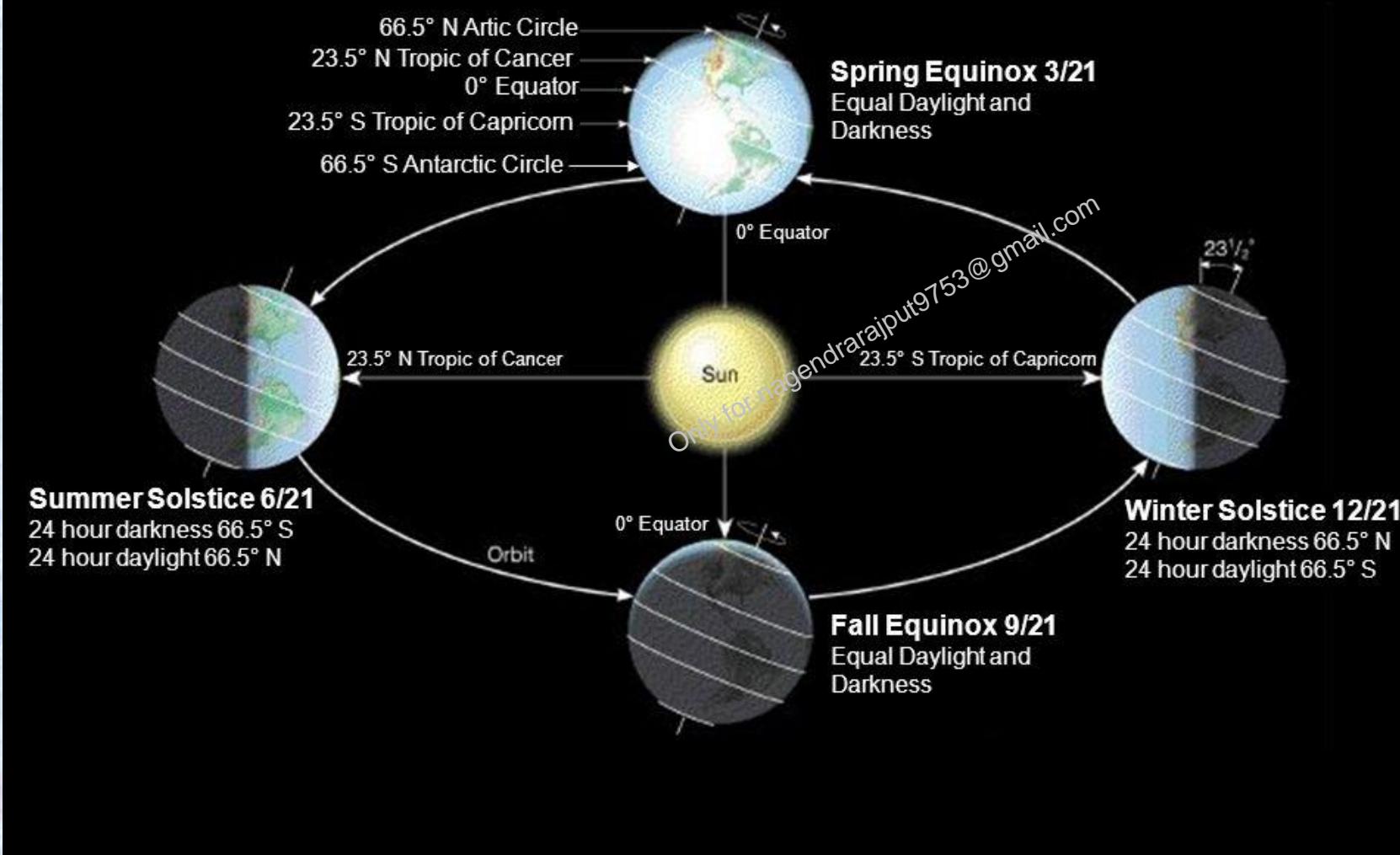
Fig. 4.3. Inclined Axis

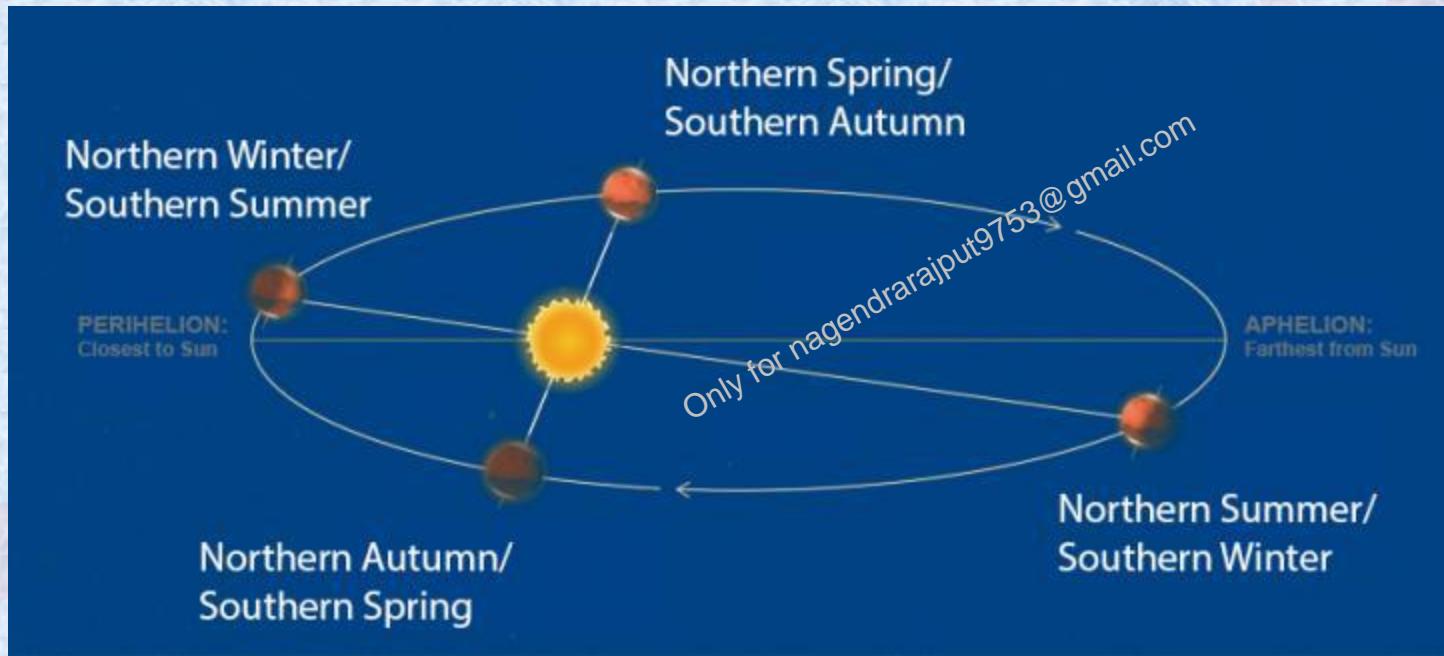
Variation of day length



Variation of day length
with seasons

Earth Sun Relations





https://www.youtube.com/watch?v=WgHmqv_-UbQ

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https://www.youtube.com/watch?v=taHTA7S_JGk



IAS

23.	Solar System and Earth	2013	Variations in the length of daytime and nighttime from season to season are due to <ul style="list-style-type: none">(a) the earth's rotation on its axis.(b) the earth's revolution round the sun in an elliptical manner.(c) latitudinal position of the place.(d) revolution of the earth on a tilted axis.
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80.

On 21st June, the Sun

- (a)does not set below the horizon at the Arctic Circle
- (b)does not set below the horizon at Antarctic Circle
- (c)shines vertically overhead at noon on the Equator
- (d)shines vertically overhead at the Tropic of Capricorn

In the northern hemisphere, the longest day of the year normally occurs in the :

- (a) First half of the month of June
- (b) Second half of the month of June
- (c) First half of the month of July
- (d) Second half of the month of July

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Time Zones

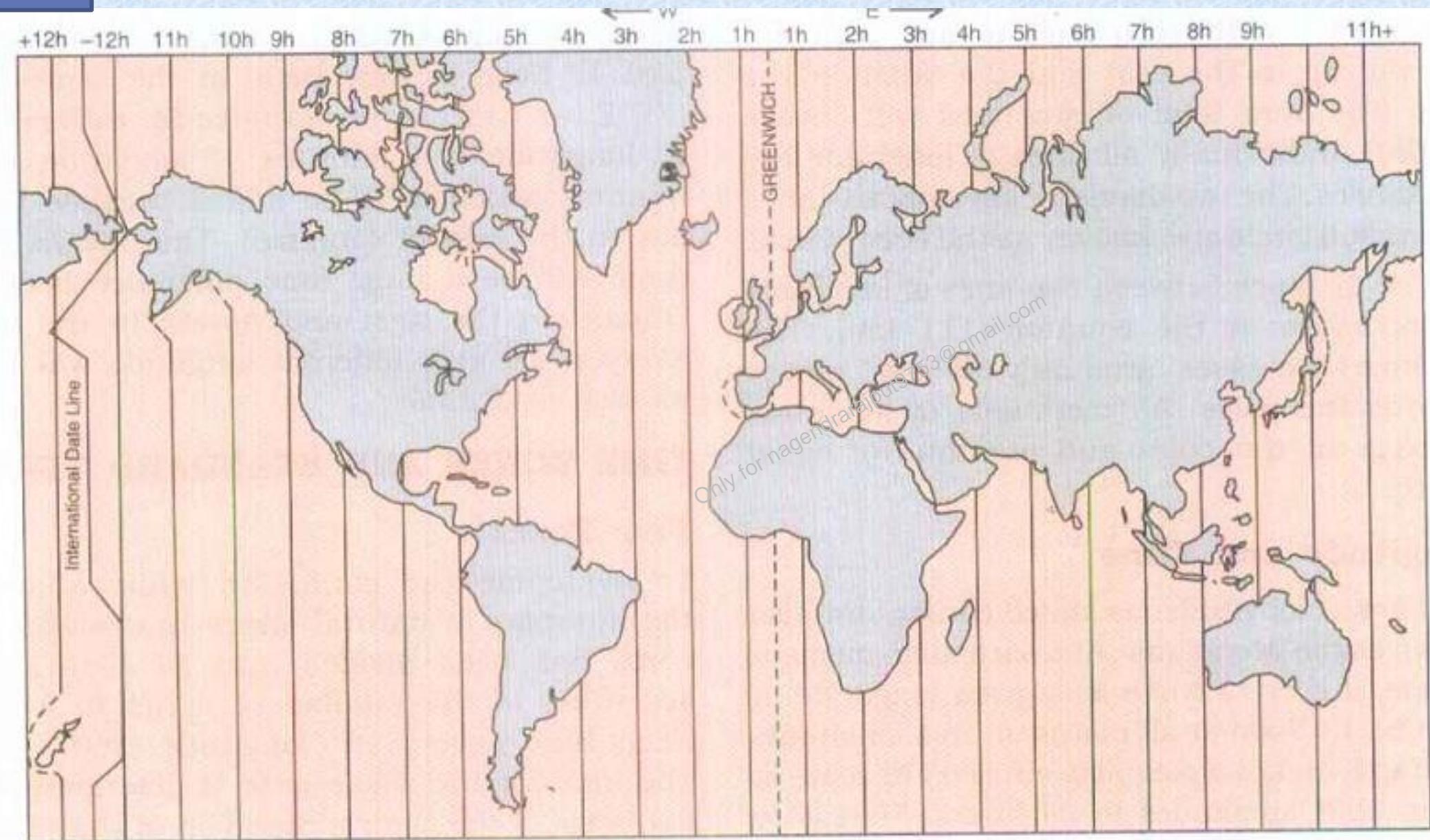
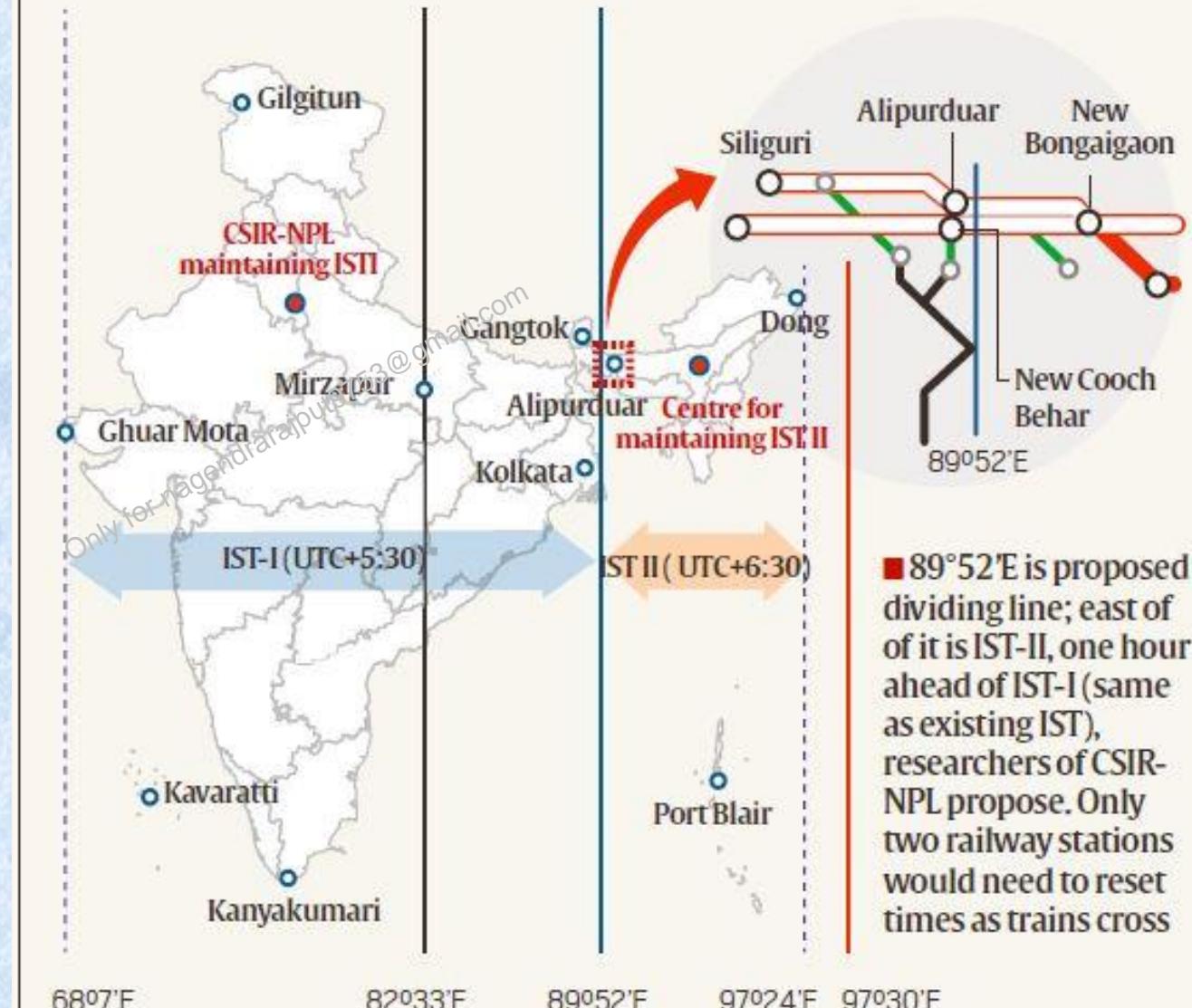


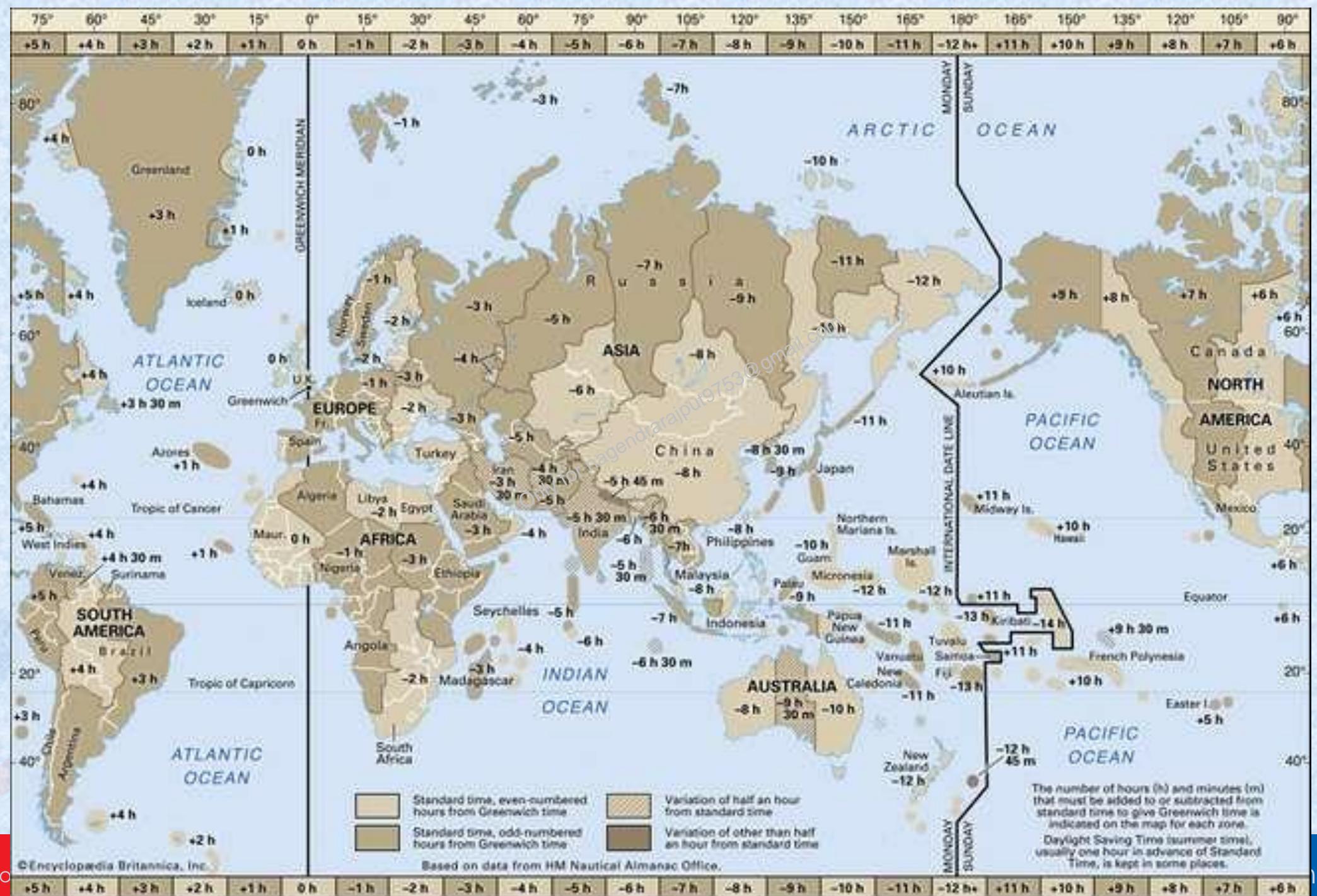
Fig. 3.8. International Date Line

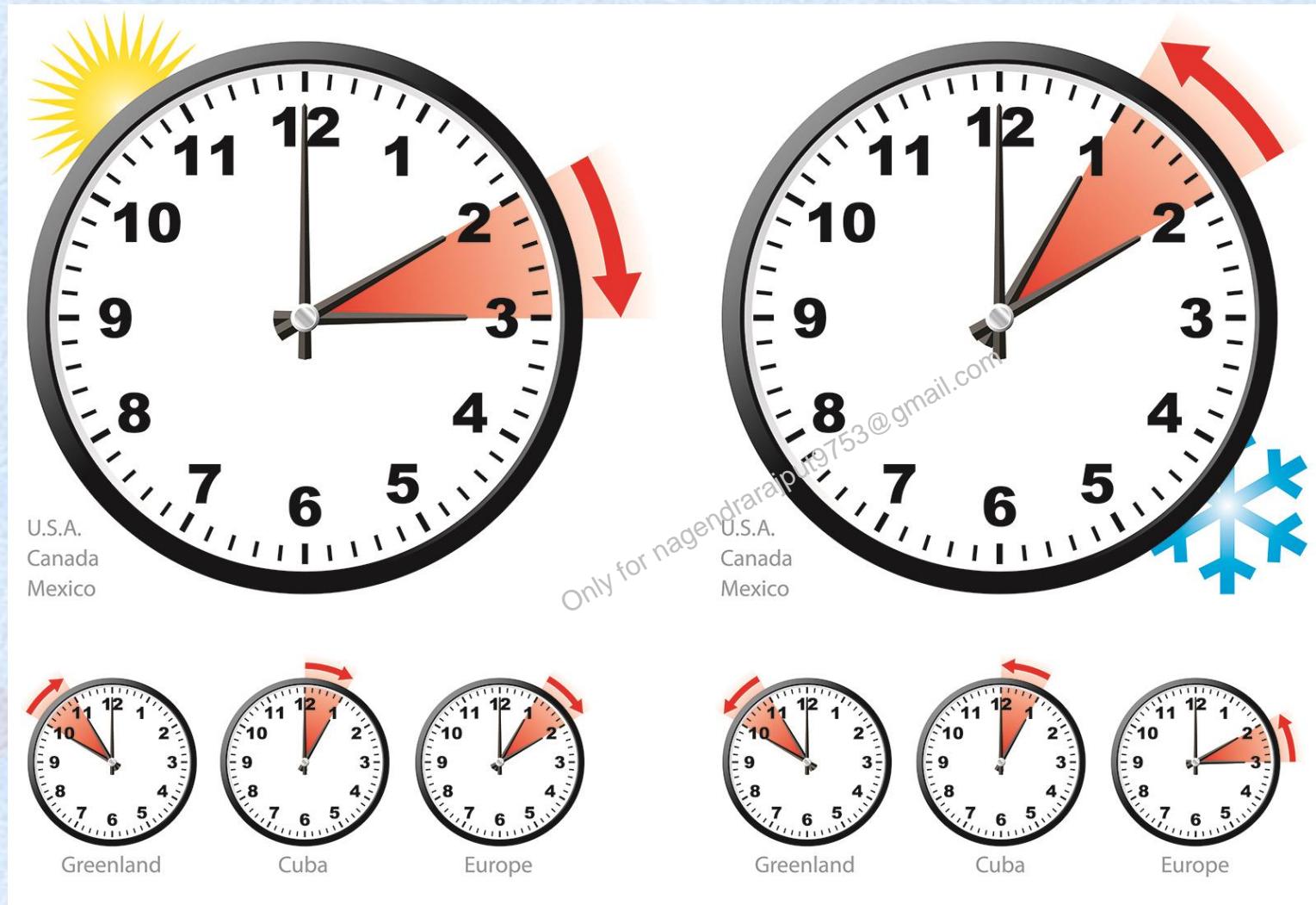


DIVISION AT 'CHICKEN NECK'



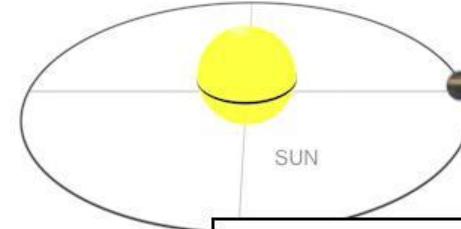
International Date Line





Orbital Cycles

Three periodic motions in Earth's orbit, known as Milankovitch cycles, contribute a predictable amount of variation to Earth's climate over time frames of tens of thousands to hundreds of thousands of years.



100,000-year cycles
Changes in Eccentricity
(Orbit Shape)

*Changes in eccentricity exaggerated so the effect can be seen. Earth's orbit shape varies between 0.0034 (almost a perfect circle) to 0.058 (slightly elliptical).

26,000-year cycles
Axial Precession
(Wobble)



41,000-year cycles
Changes in Obliquity
(Tilt)

Relative to orbital plane
22.1-24.5°



What is Universe?

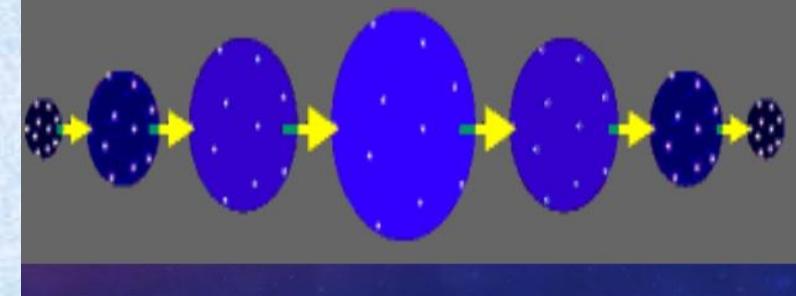
Origin of Universe

- Steady state theory
- Pulsating theory
- Big Bang theory

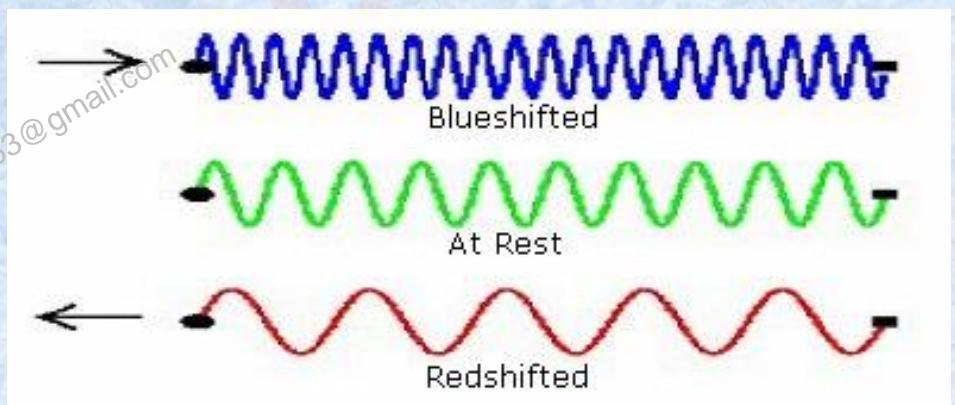
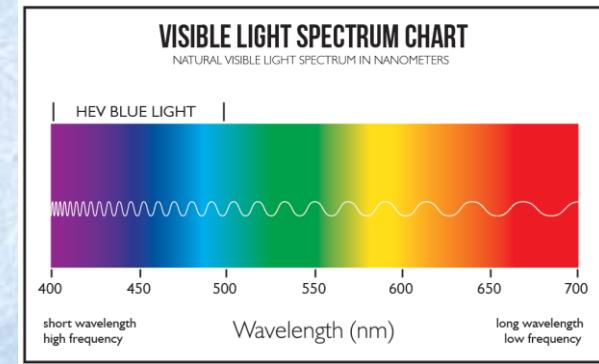
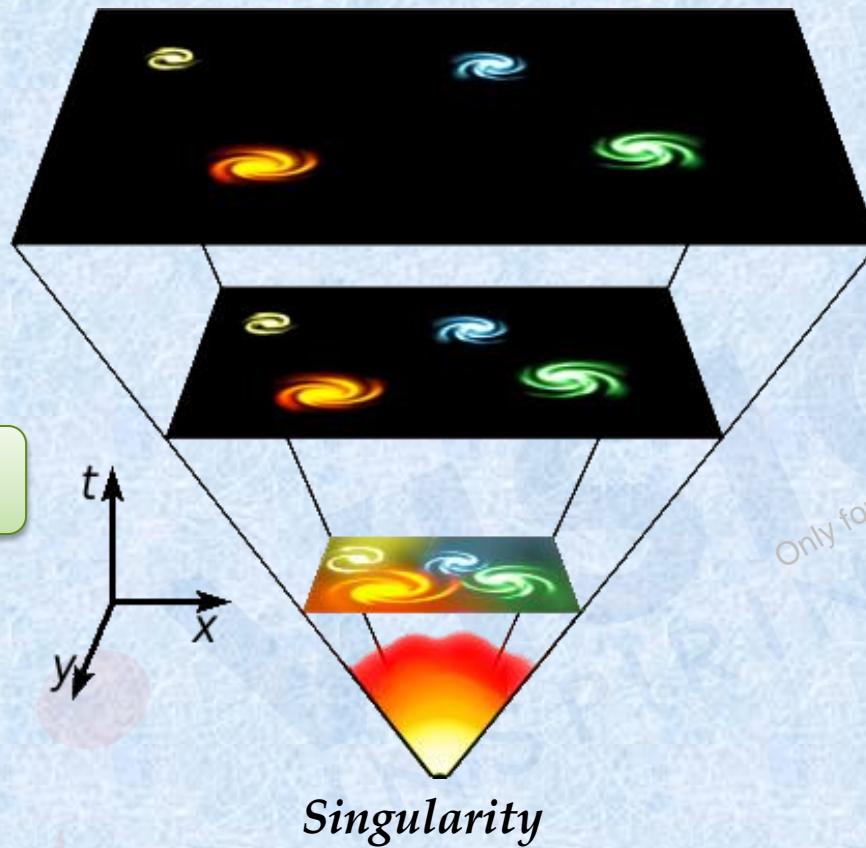
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Pulsating Universe Theory

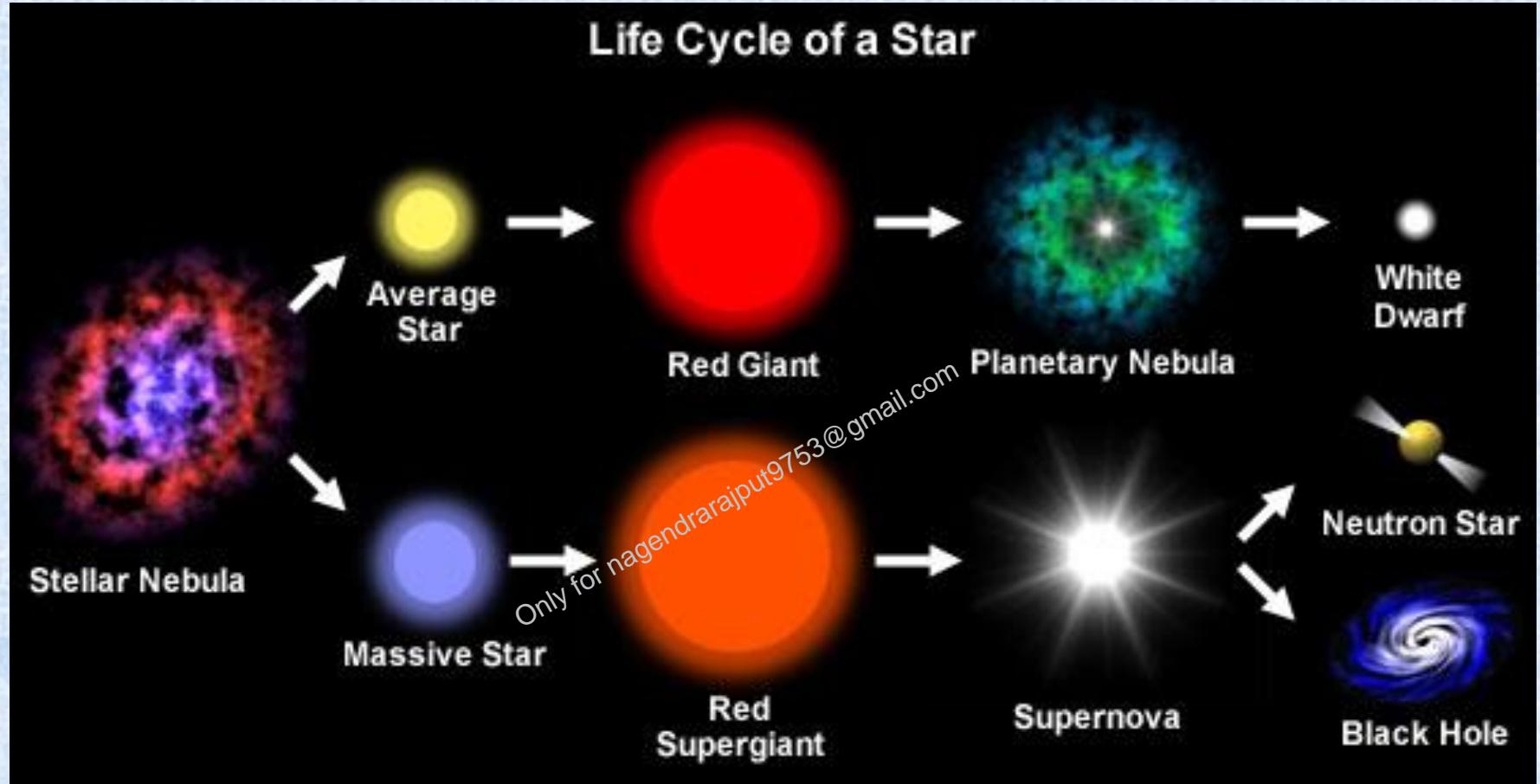


Universe and Origin of universe



Hubble's constant

Life cycle of a star



Galaxies & Stars



Spiral galaxy

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Elliptical galaxy



Irregular galaxy



Milkyway Galaxy

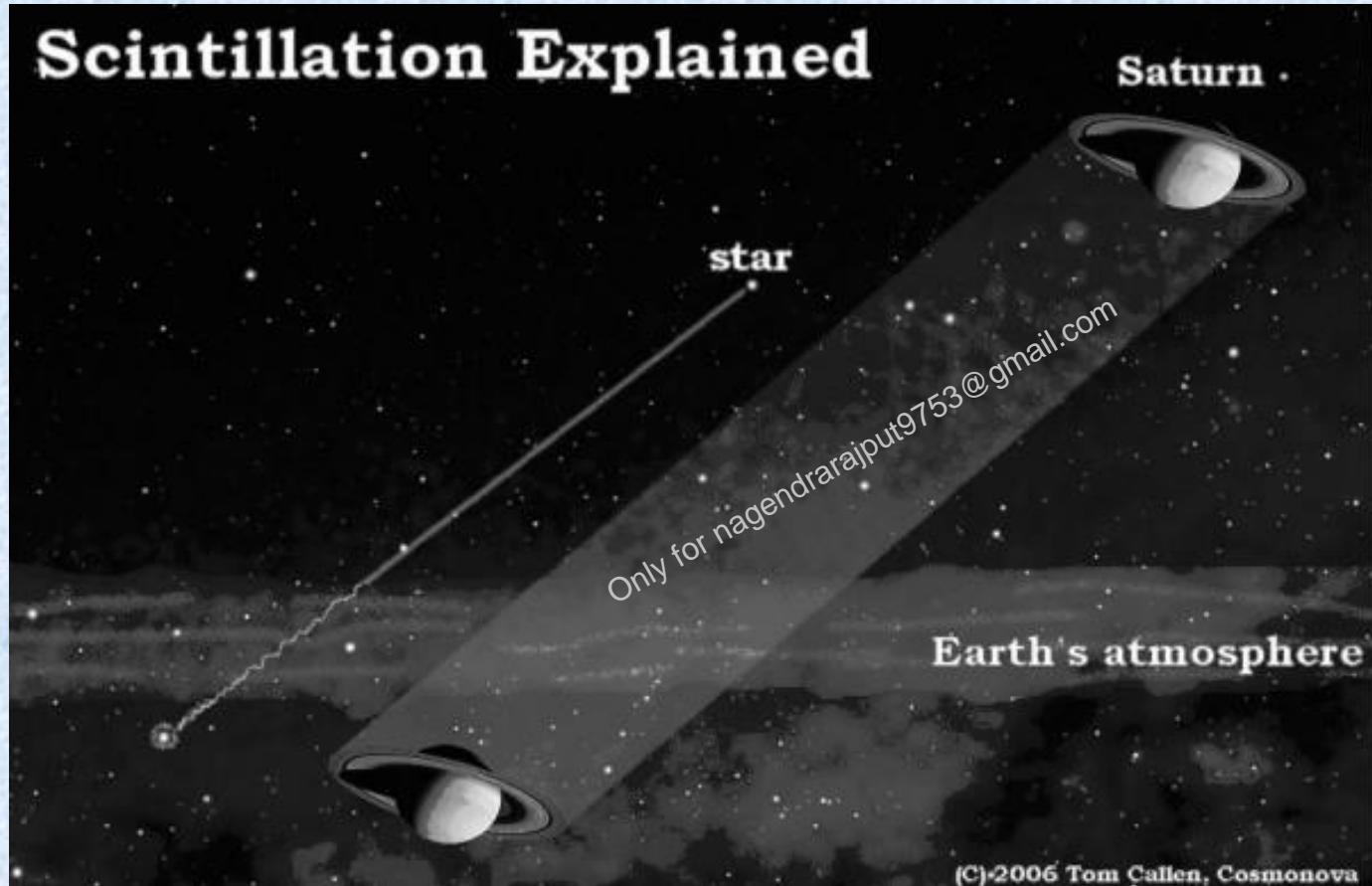
<https://www.youtube.com/watch?v=1zJ9FnQXmJI>

Rotation of Earth

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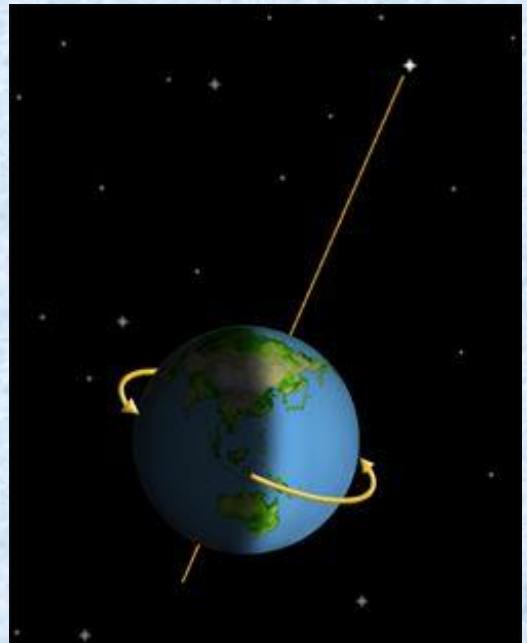


**Collision of Milkyway and
Andromeda Galaxies**

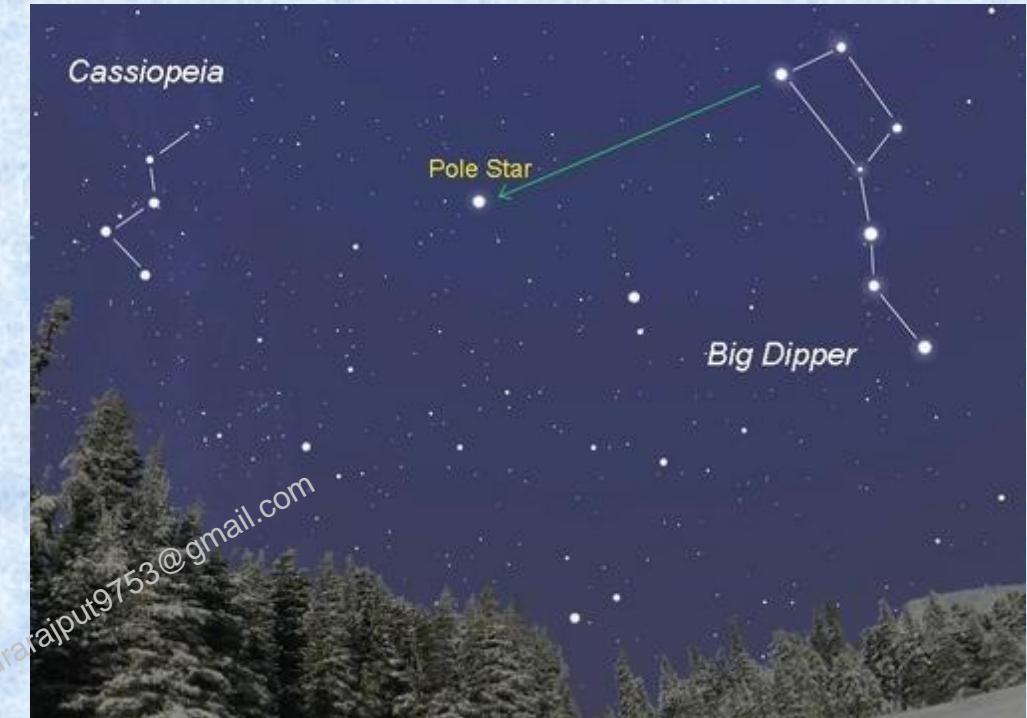


Twinkling of stars

Galaxies & Stars

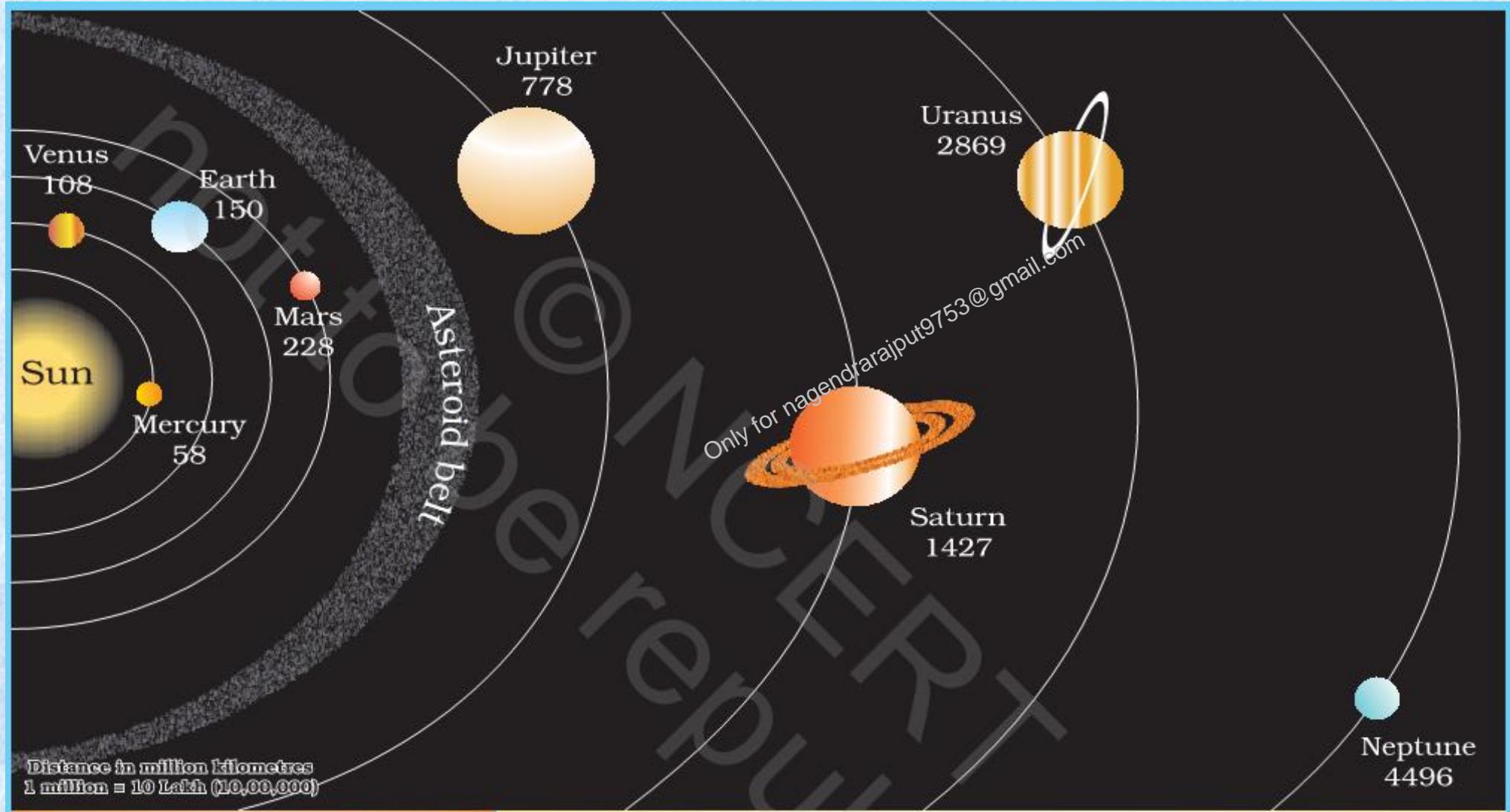


Pole star



22.	Solar System and Earth	2012	A person stood alone in a desert on a dark night and wanted to reach his village which was situated 5 km east of the point where he was standing. He had no instruments to find the direction but he located the polestar. The most convenient way now to reach his village is to walk in the (a) direction facing the polestar (b) direction opposite to the polestar (c) direction keeping the polestar to his left (d) direction keeping the polestar to his right
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Solar System



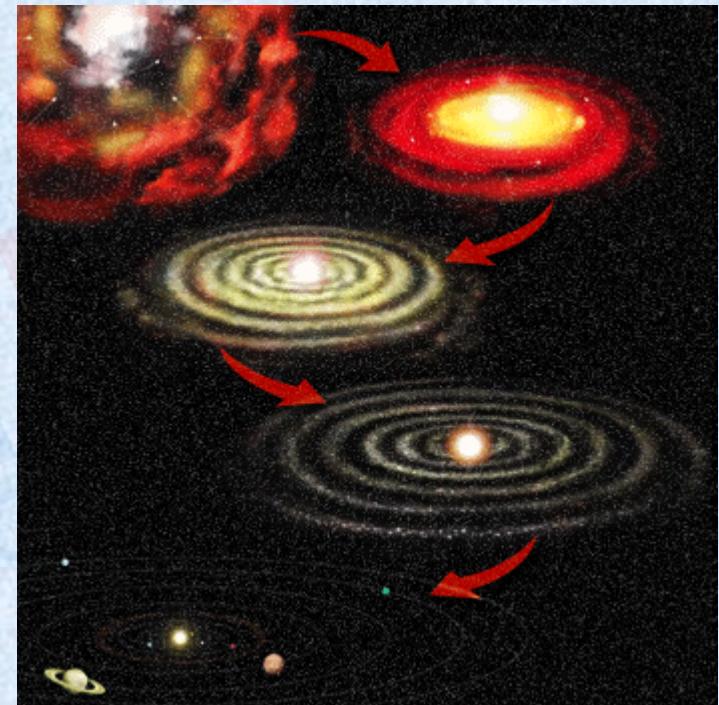
Evolutionary Theories

- Gaseous hypothesis
- Nebular hypothesis

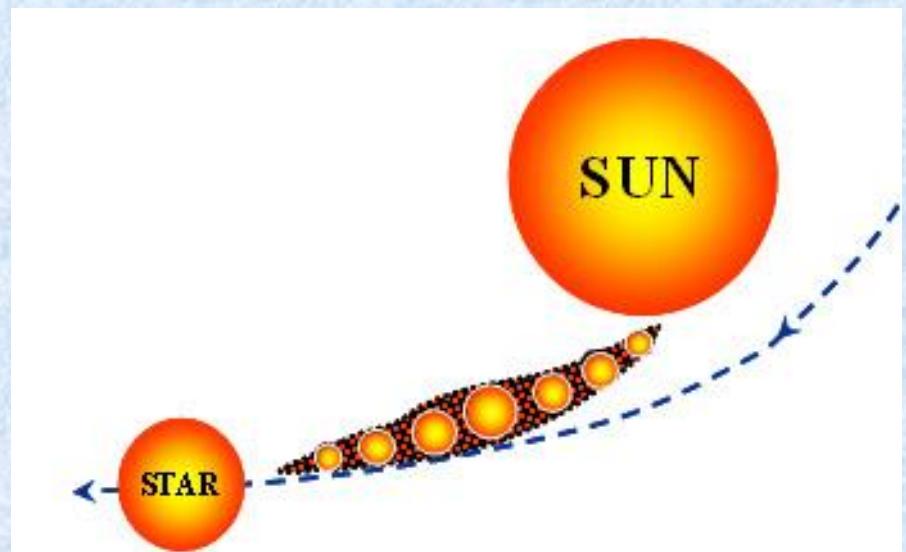
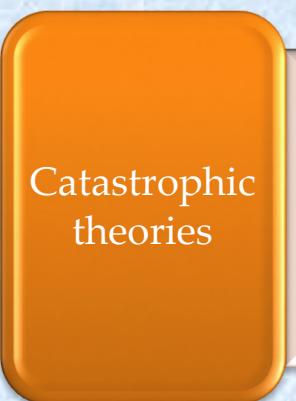
Catastrophic theories

- Planetesimal theory
- Tidal hypothesis

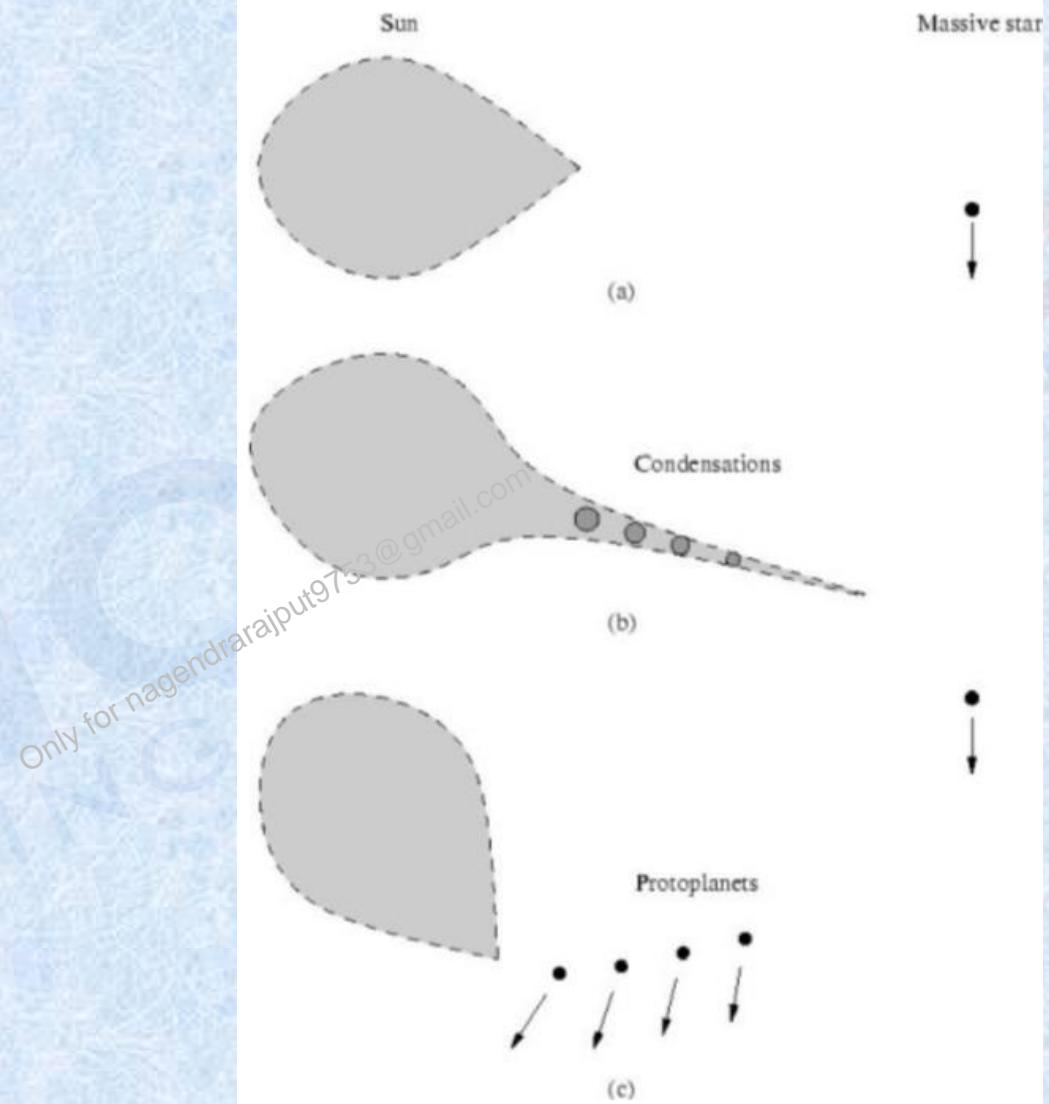
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Solar System

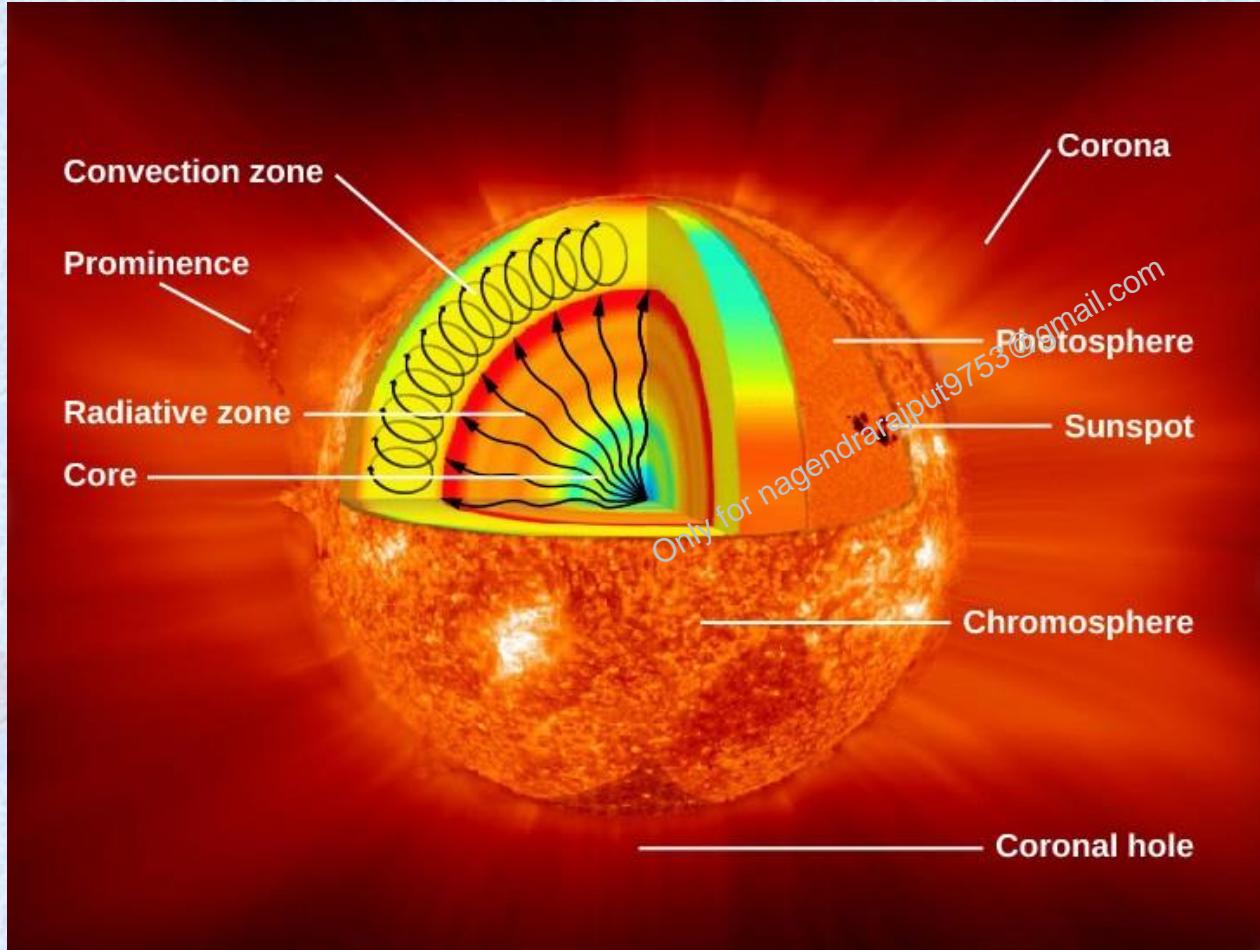


Planetesimal theory

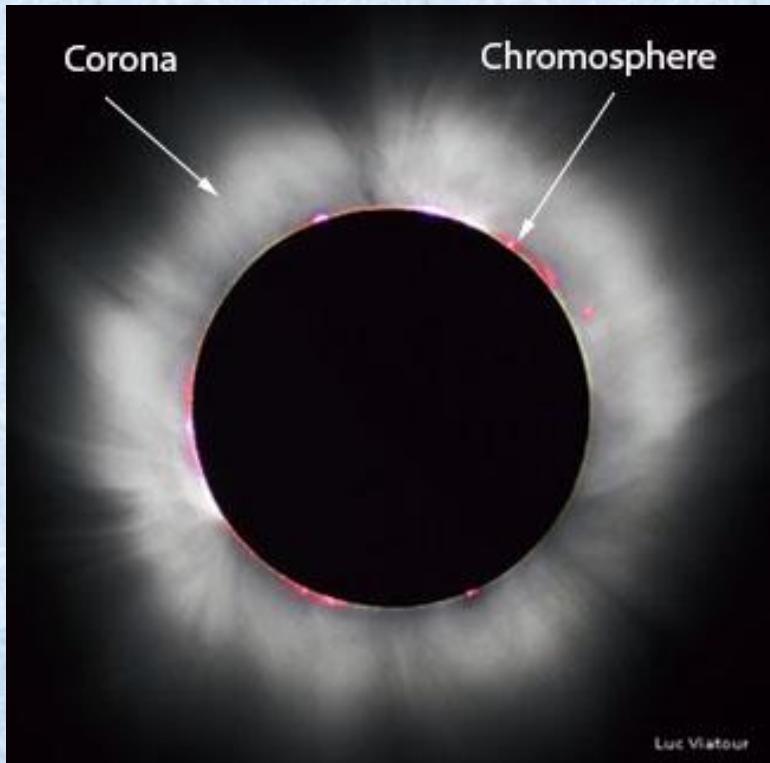


Tidal Hypothesis

Different layers of the Sun



Different layers of the Sun

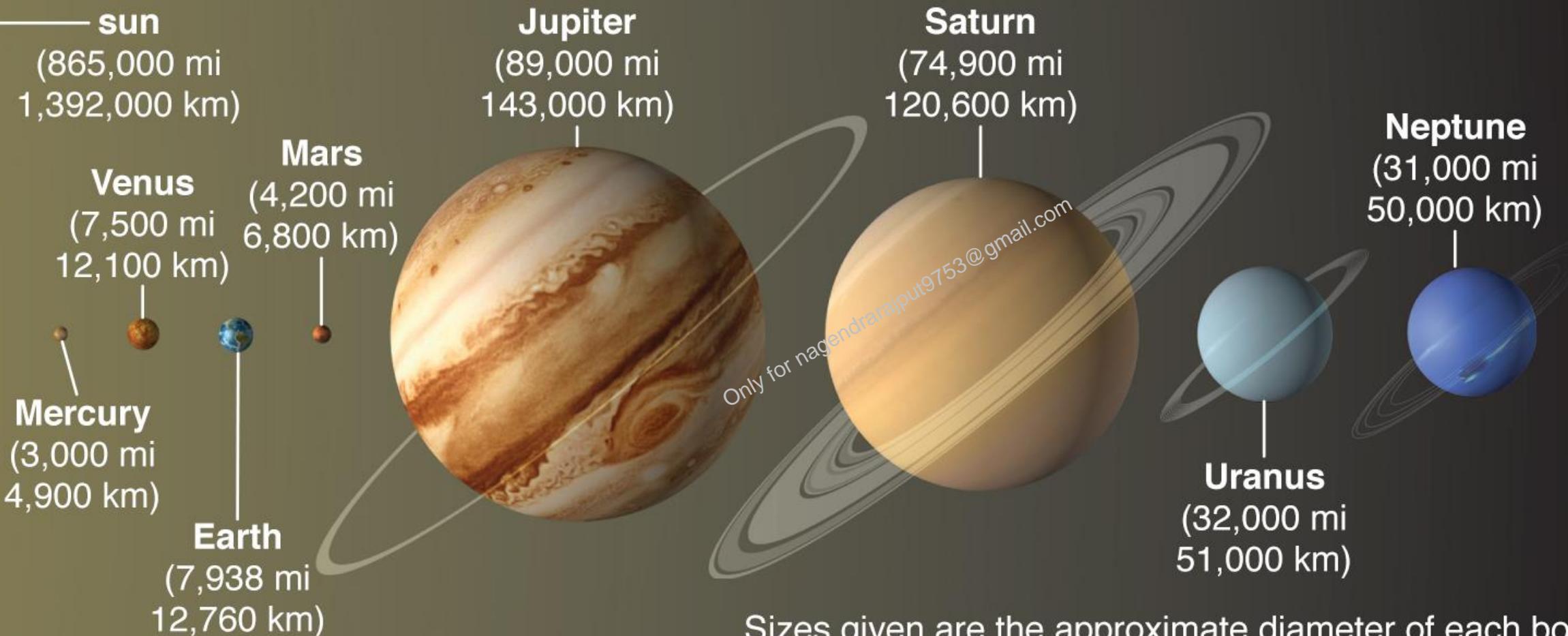


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<https://www.youtube.com/watch?v=S3I30ZzsIKU>

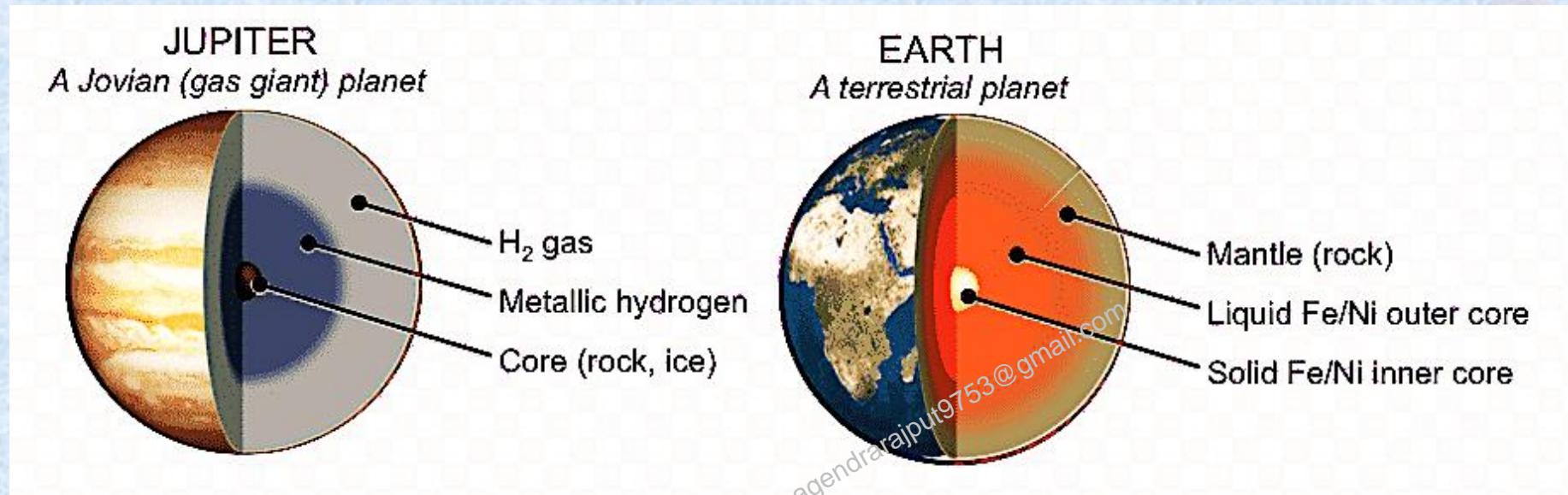
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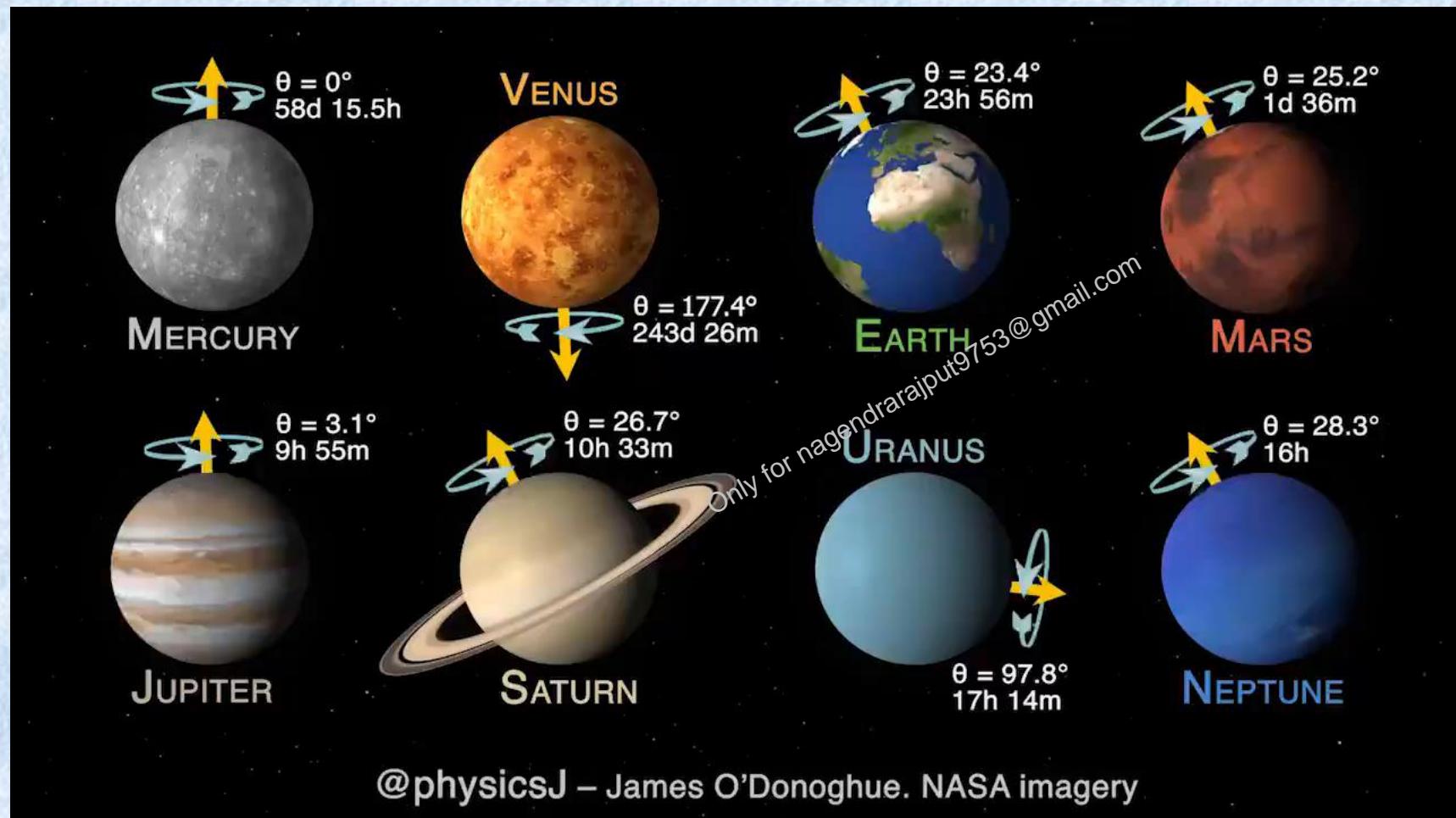
Different layers of the Sun

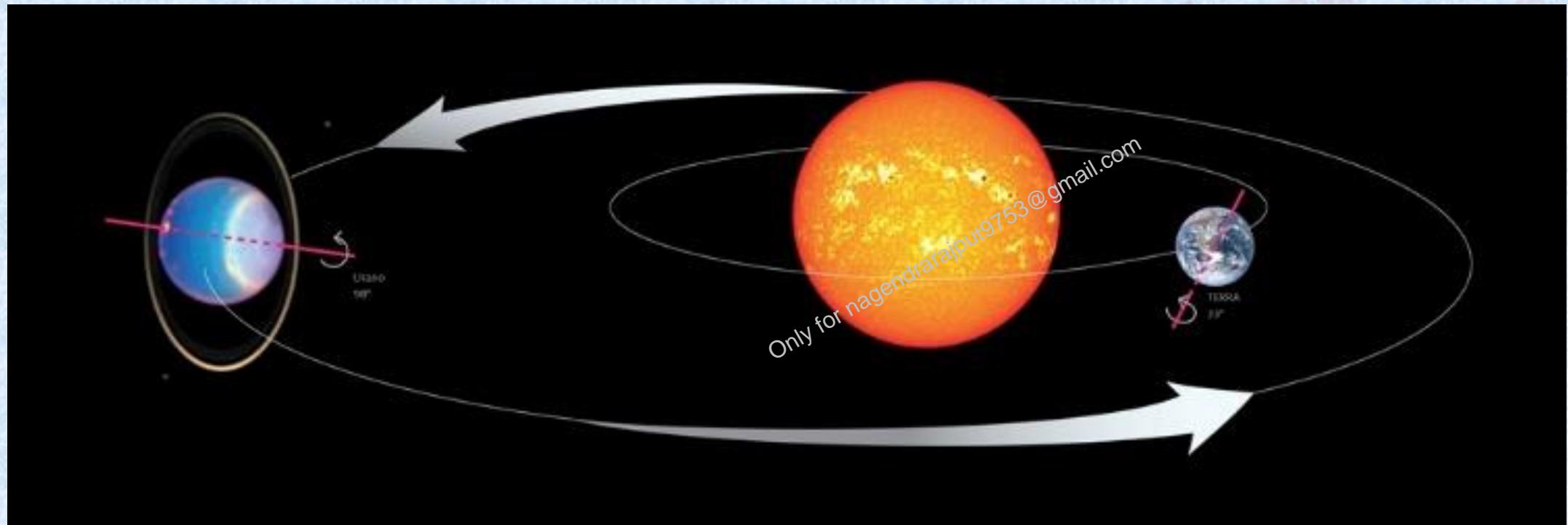




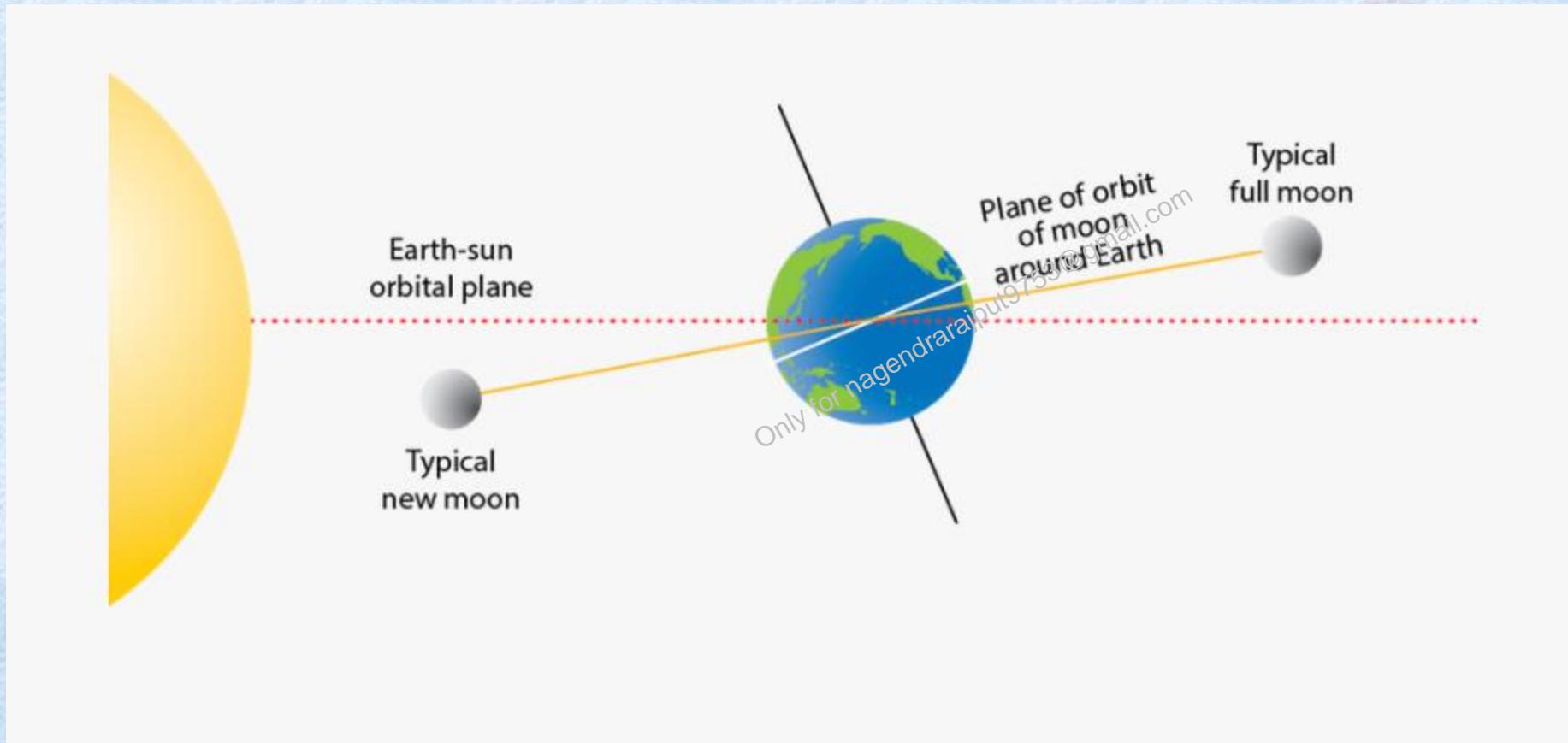
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24.	Solar System and Earth	2015	The term "Goldilocks Zone" is often seen in the news in the context of (a) the limits of habitable zone above the surface of the Earth (b) regions inside the Earth where shale gas is available (c) search for the Earth-like planets in outer space (d) search for meteorites containing precious metals
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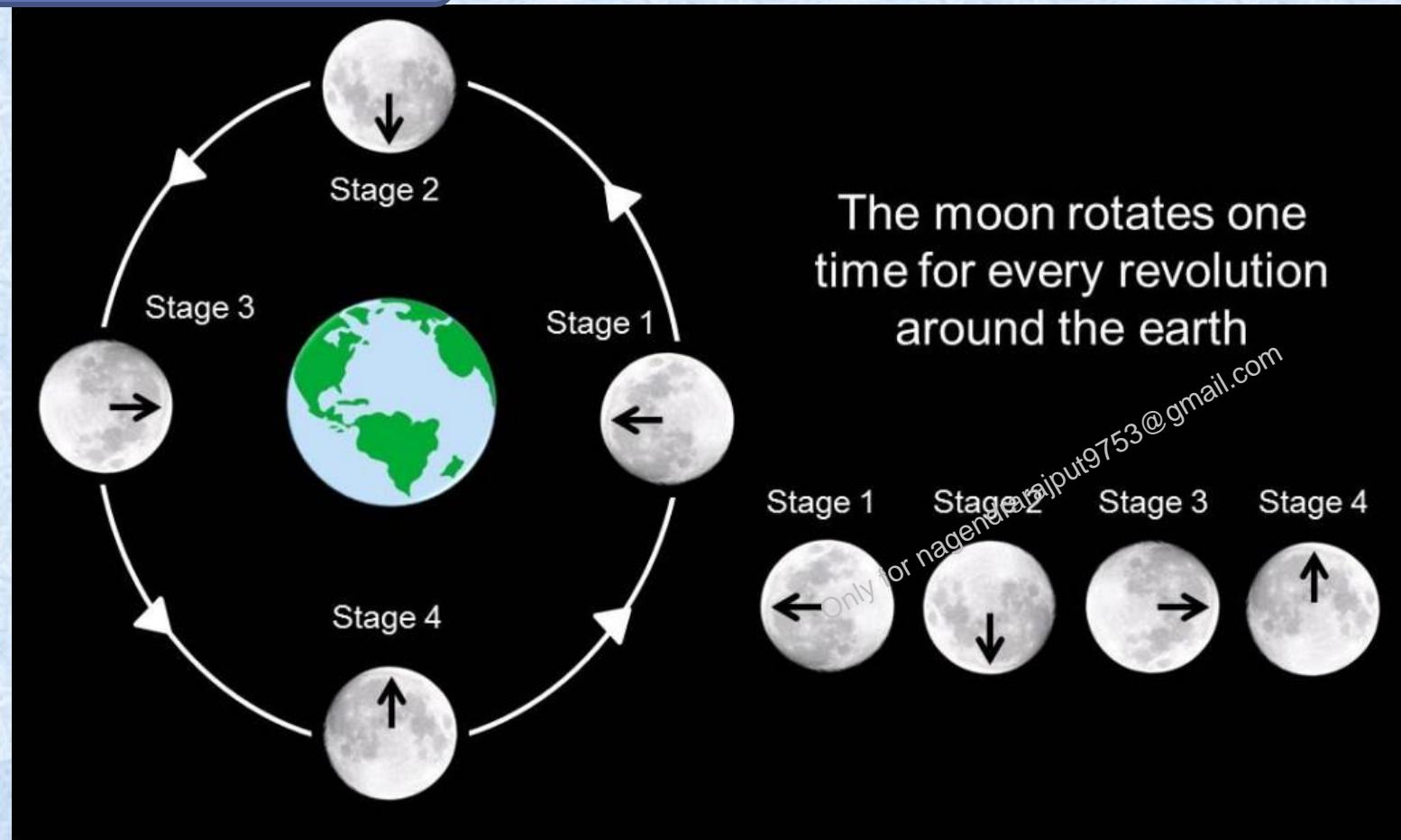
Position of Sun, Earth & Moon

Planets, satellites and other bodies



Planets, satellites and other bodies





https://www.youtube.com/watch?v=OZIB_leg75Q

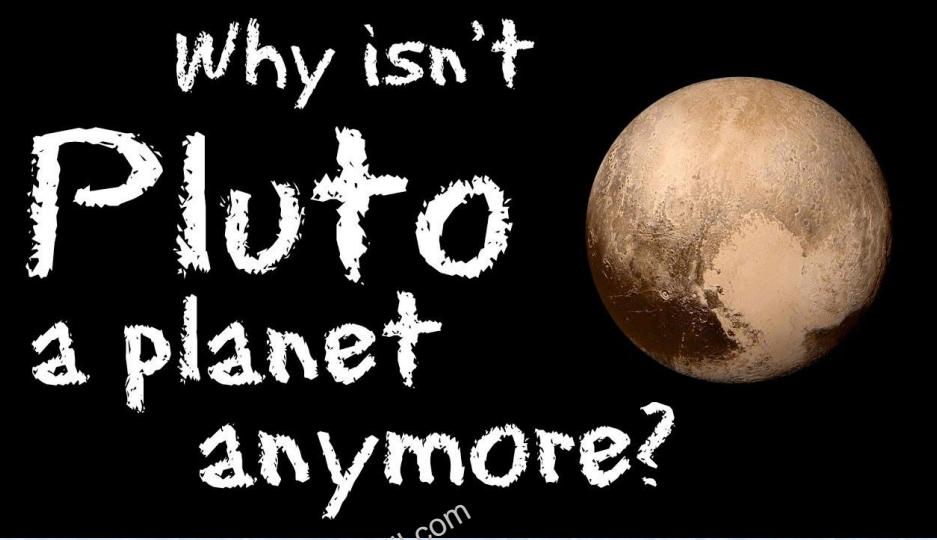
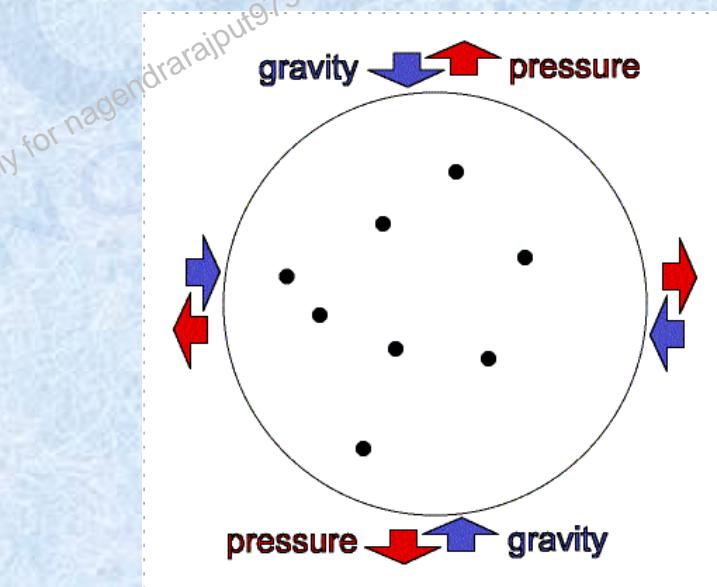
What is a Dwarf Planet?

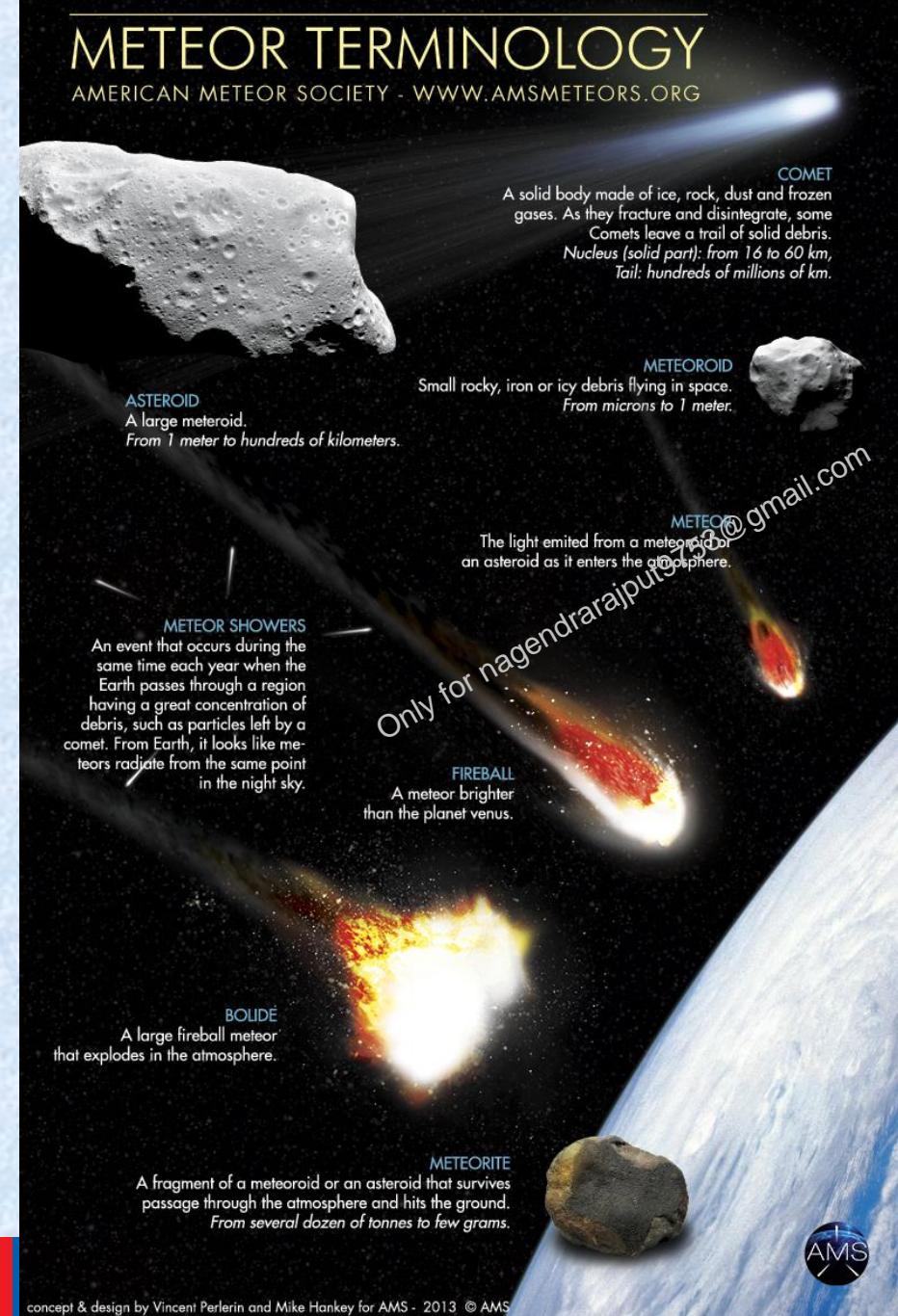
Orbit around the sun

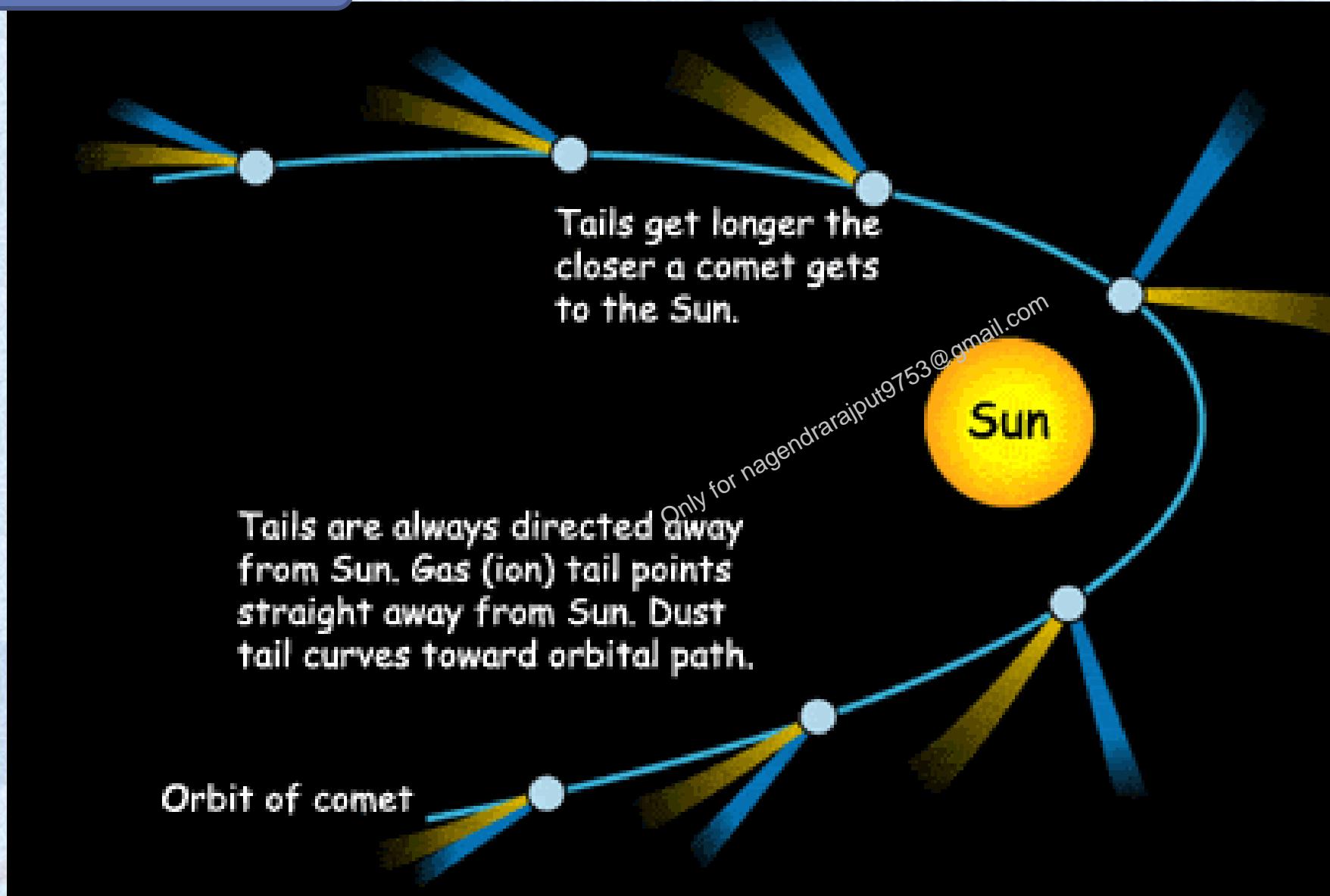
Enough mass to achieve hydrostatic equilibrium

Cleared neighborhood

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S
C



Comet Neowise

19.	Solar System and Earth	2008	In order of their distances from the Sun, which of the following planets lie between Mars and Uranus? (a) Earth and Jupiter (b) Jupiter and Saturn (c) Saturn and Earth (d) Saturn and Neptune
20.	Solar System and Earth	2009	Which one of the following planet has largest number of natural satellites or moons? (a) Jupiter (b) Mars (c) Saturn (d) Venus
21.	Solar System and Earth	2011	Which is the difference between asteroids and comets? 1. Asteroids are small rocky planetoids, while comets are formed of frozen gases held together by rocky and metallic material. 2. Asteroids are found mostly between the orbits of Jupiter and Mars, while comets are found mostly between Venus and Mercury. 3. Comets show a perceptible glowing tail, while asteroids do not. Which of the statements given above is/are correct? (a) 1 and 2 only (b) 1 and 3 only (c) 3 only (d) 1, 2 and 3

Size of Universe

<https://www.youtube.com/watch?v=TXfQZhZGtNw&t=171s>

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Solar system to scale

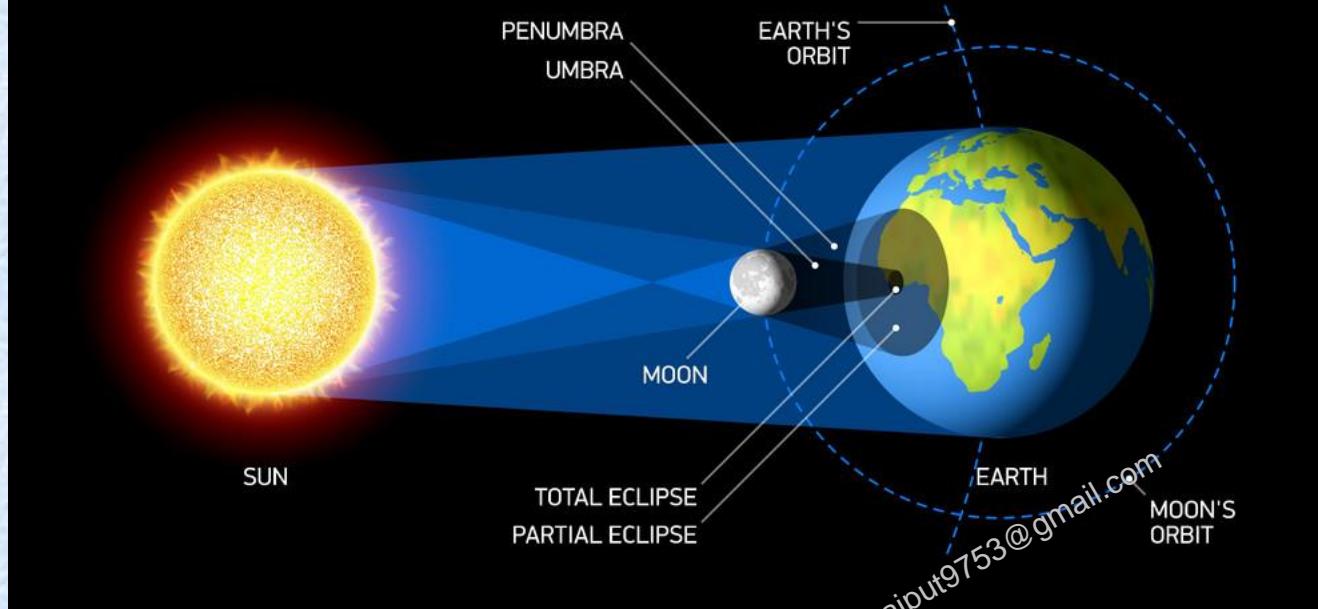
<https://www.youtube.com/watch?v=zR3Igc3Rhfg>

Solar system in motion

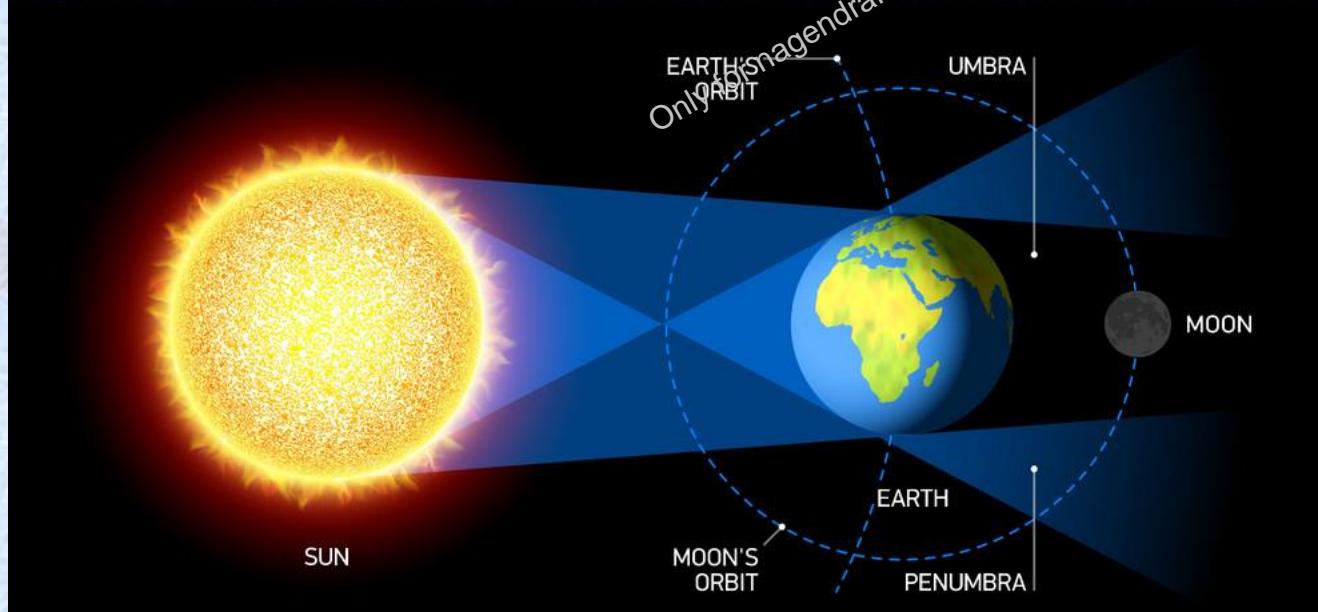
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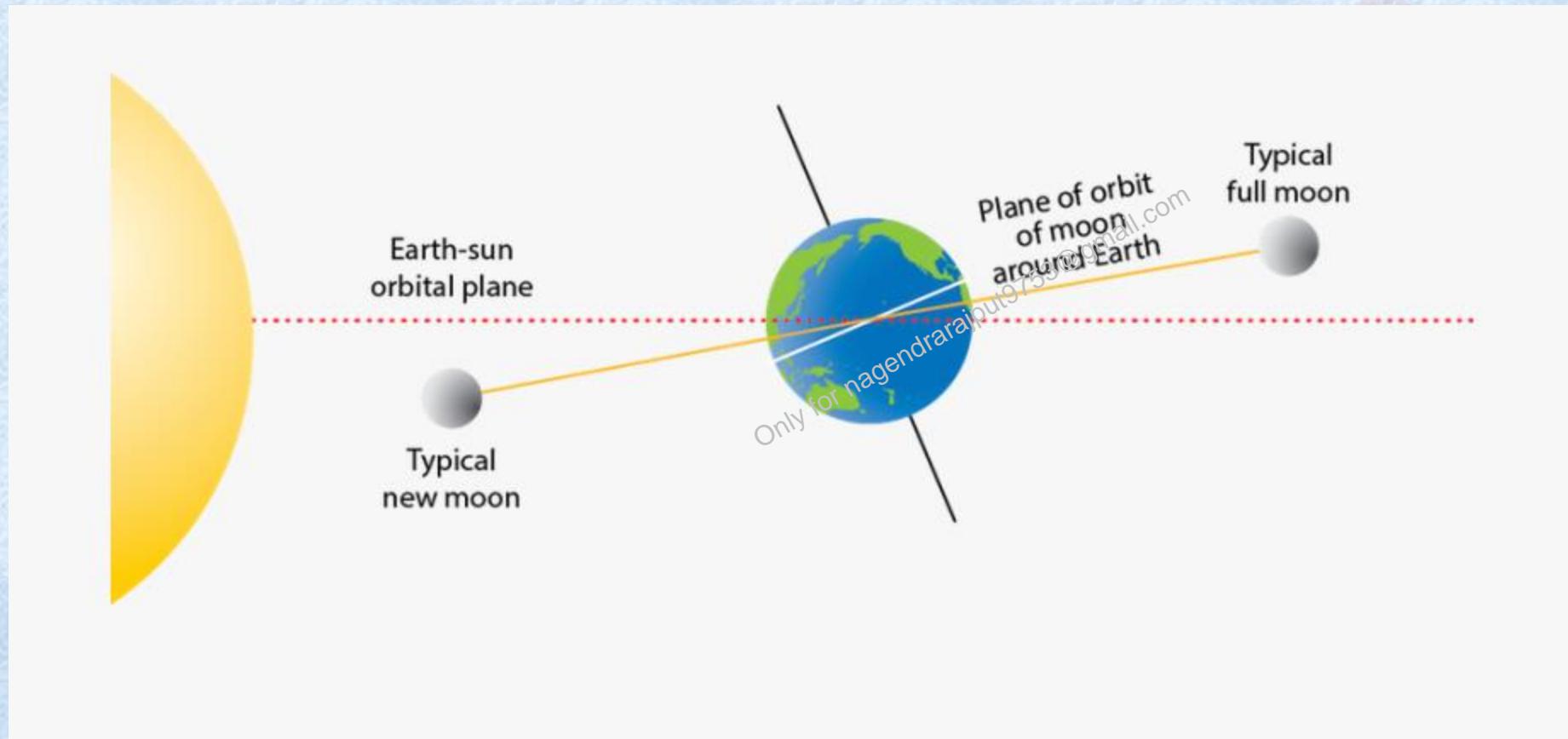
Eclipses

Solar eclipse

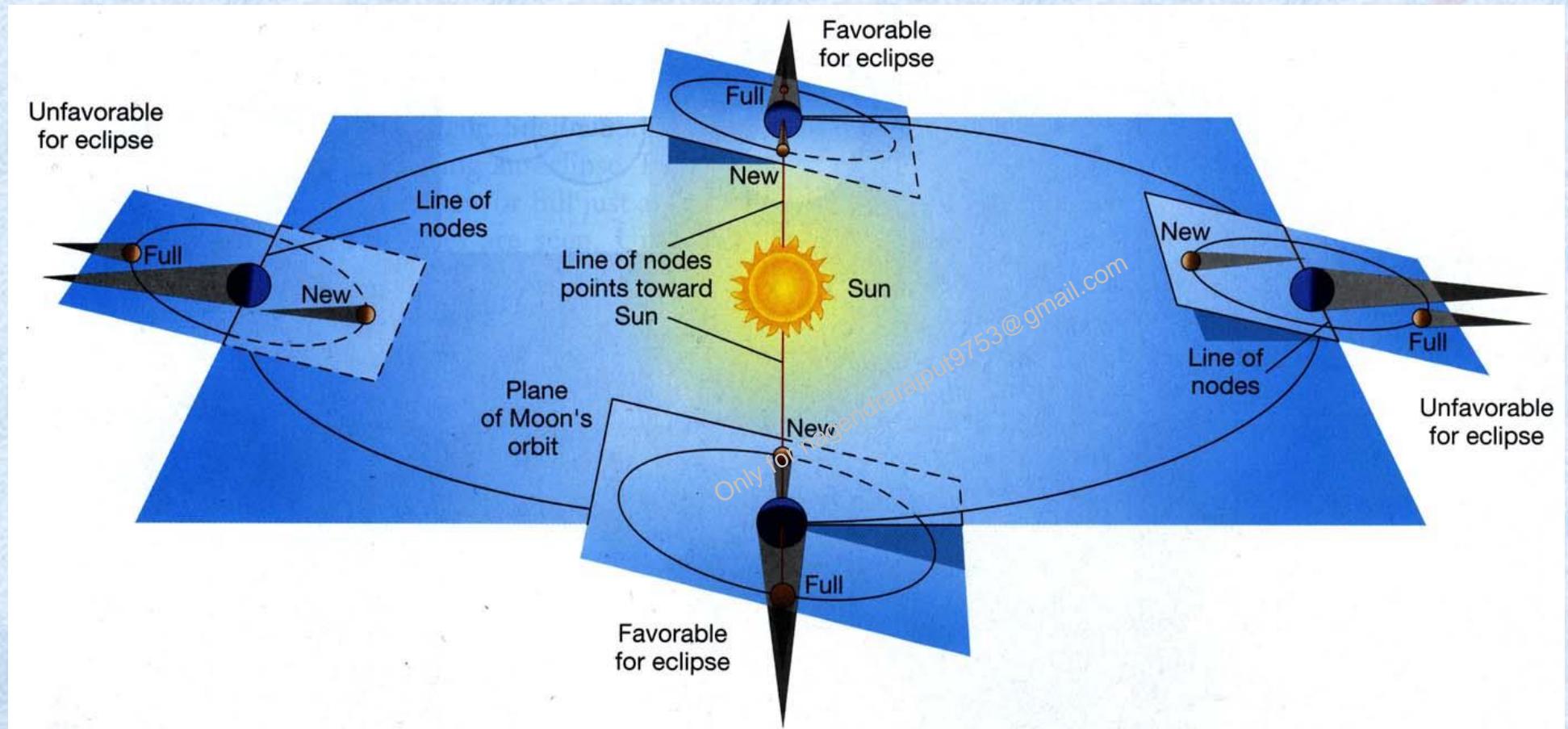


Lunar eclipse





Position of Sun, Earth & Moon

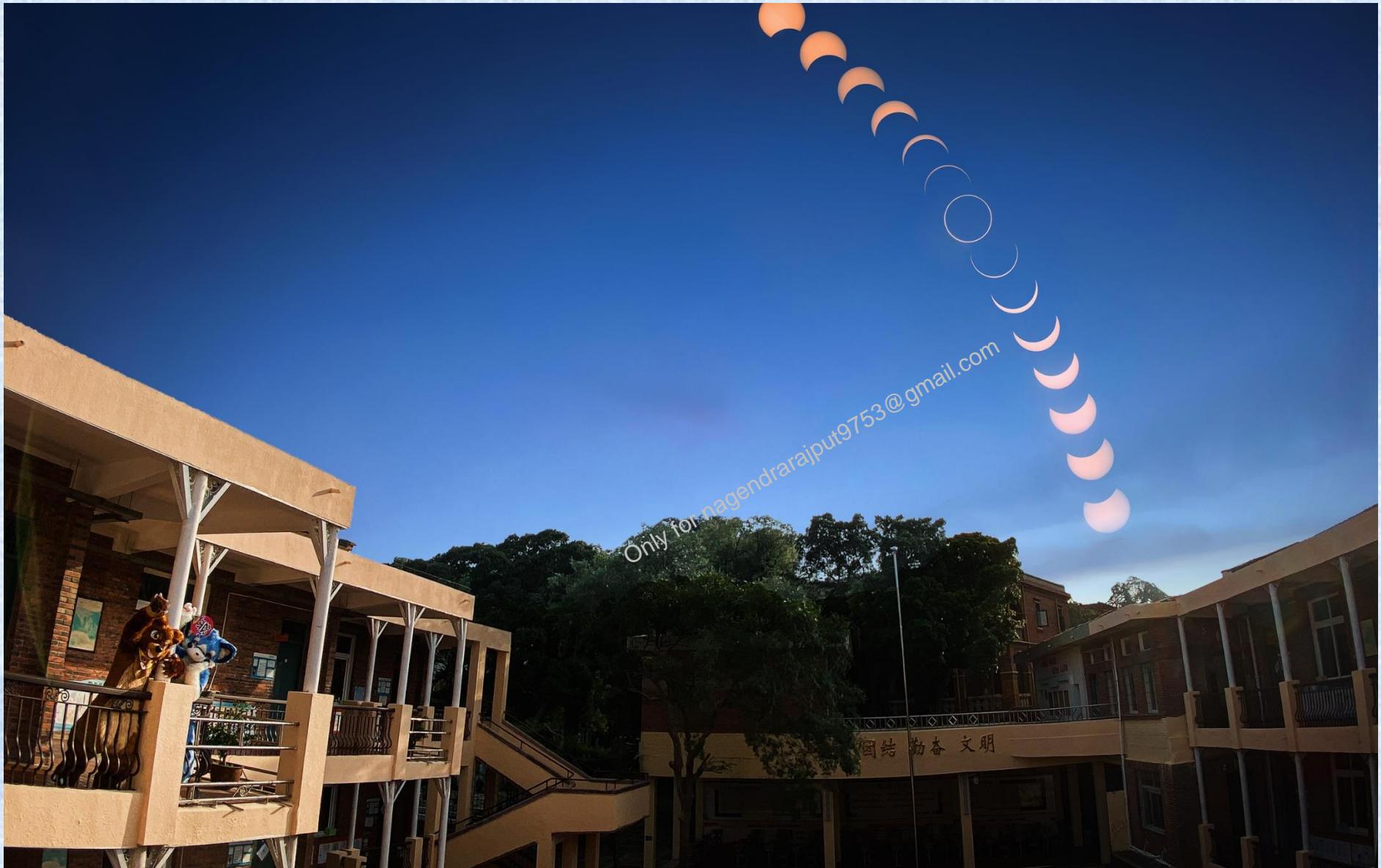


Position of Sun, Earth & Moon



Types of Solar
eclipse

<https://www.youtube.com/watch?v=cxrLRbkOwKs>



Annular Solar eclipse of
21 June, 2020

Types of Lunar eclipse

<https://www.youtube.com/watch?v=VW2xRR75lKE>

Total Lunar Eclipse



Entire Moon passes through full shadow.



Partial Lunar Eclipse



Part of the Moon passes through full shadow.



Penumbral Lunar Eclipse



Moon passes only through partial shadow.





Blood Moon



Questions??



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- Online query (For faster reply)
- Read and revise what is taught
- Read the reference material
- Mentoring sessions

If Dil Maange beyond MORE...

Mail: rajesh@visionias.in
Twitter: [@naturiousoul](https://twitter.com/naturiousoul)