The Sky From Earth

Overview

A. WHAT do we see?

1. What is the Celestial Sphere?
2. What are Meridian, the Celestial Equator, and Zenith?
3. How do the stars move?
4. How does the Sun move?
5. How do the Planets move?
6. What are the time scales of these motions?
7. How does my view change with position on Earth?

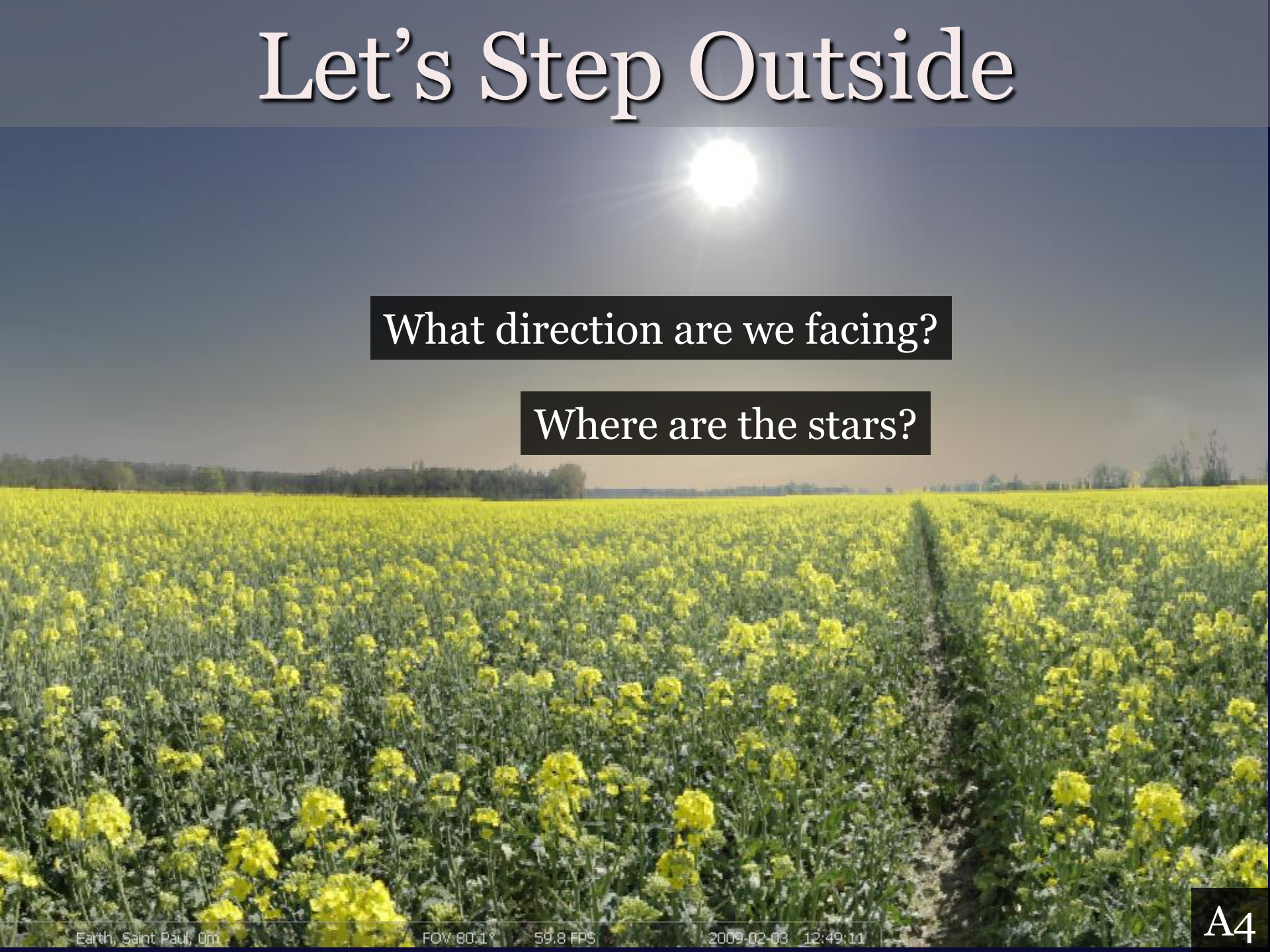
B. WHY do we see what we see?

1. Why does the horizon block half the sky?
2. WHY to questions A4 through A7

Overview

C. Miscellaneous Tidbits
   1. What causes the seasons?
   2. What is a Sidereal Day?
   3. What is a Solar Day?

Let’s Step Outside



A4

ABCD

Which direction is the noon Sun in St. Paul?:

A. North

B. South

C. West

D. Straight Up

Sunset


What direction are we facing now?
Earth, Saint Paul, 0m
FOV 80.1°
56.3 FPS
2009-02-03 17:14:19
A4

Important Locations

Zenith- The point on the Celestial Dome that is directly overhead.

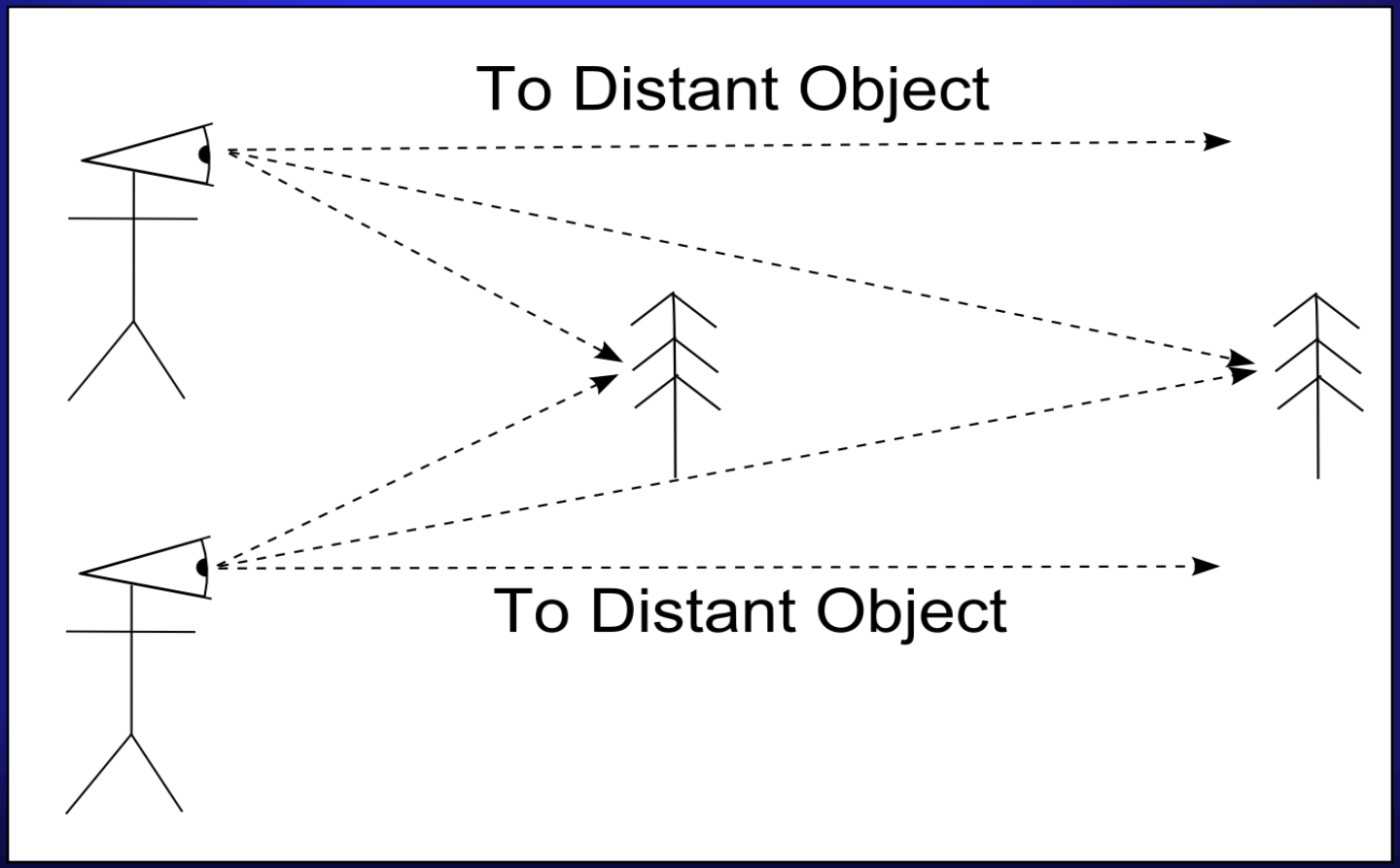
Meridian- An imaginary line through Zenith extending from North to South.

Celestial Equator- The projection of the Earth's equator onto the Celestial Sphere.

A1,A2,A3

Lines of Sight

Lines of sight to distant objects (like stars) are **PARALLEL**



Time 1 - Hours

A3

Time 2 - Days

A3

I Need a New Latitude

ABCD

A long exposure photograph shows the stars moving in perfect circles around zenith. (the stars neither rise or set). You are:

A. In Orbit

B. At the Earth's equator

C. At one of the Earth's poles .

D. At Gerry's House

ABCD

A long exposure photograph shows the stars are rising and setting perpendicular to the horizon and traveling in large arcs.

A. In Orbit

B. At the Earth's equator

C. At one of the Earth's poles .

D. At Gerry's House

ABCD

Stars that can be seen all year are:

A. Near the Celestial Poles

B. Near the Celestial Equator

C. Near the Sun.

D. No stars can be seen all year.

ABCD

At Summer Solstice, the direction of sunsets is:

A. Directly West

B. Directly East

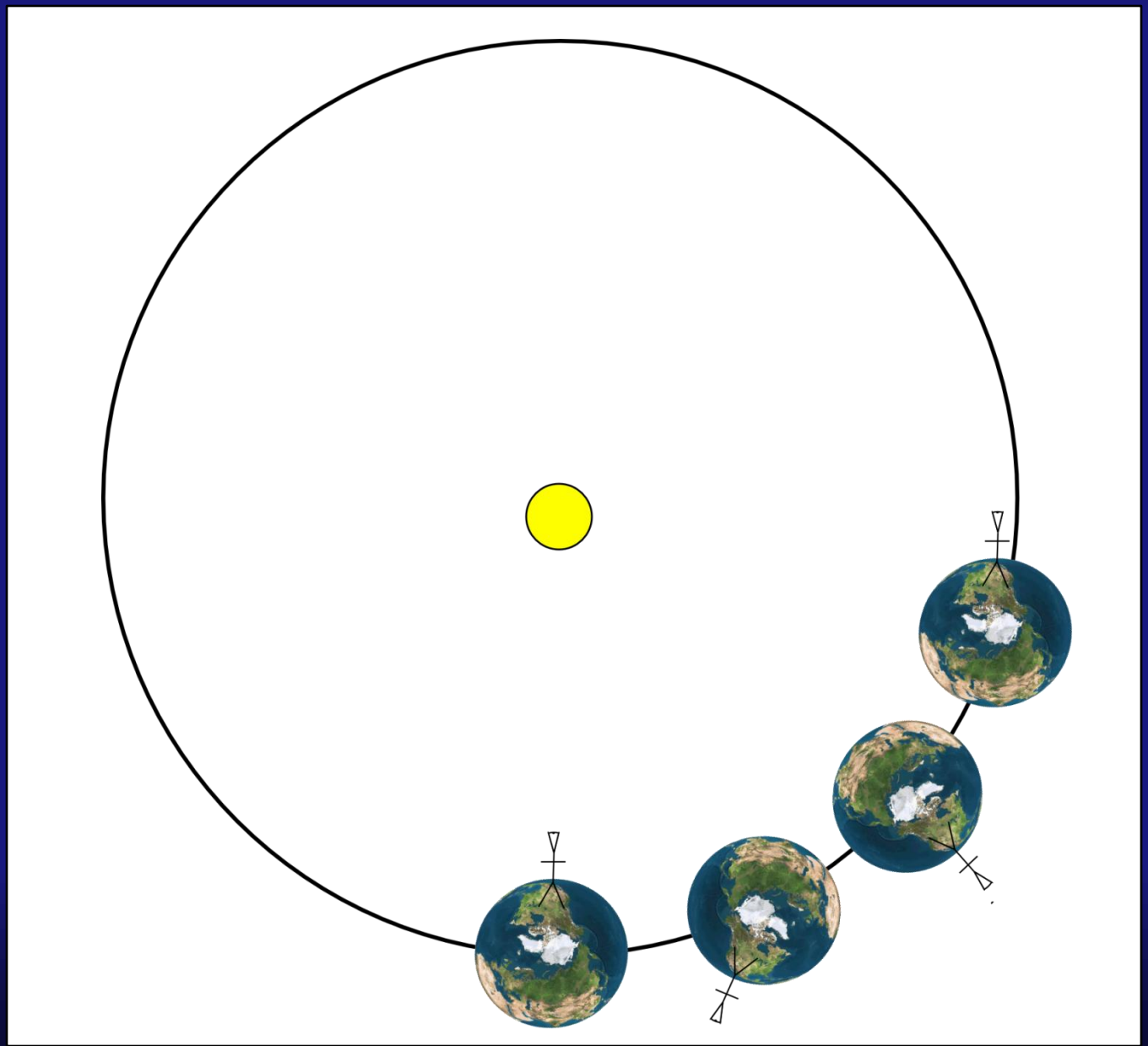
C. North of West or East

D. South of West or East

The Sun - Hours

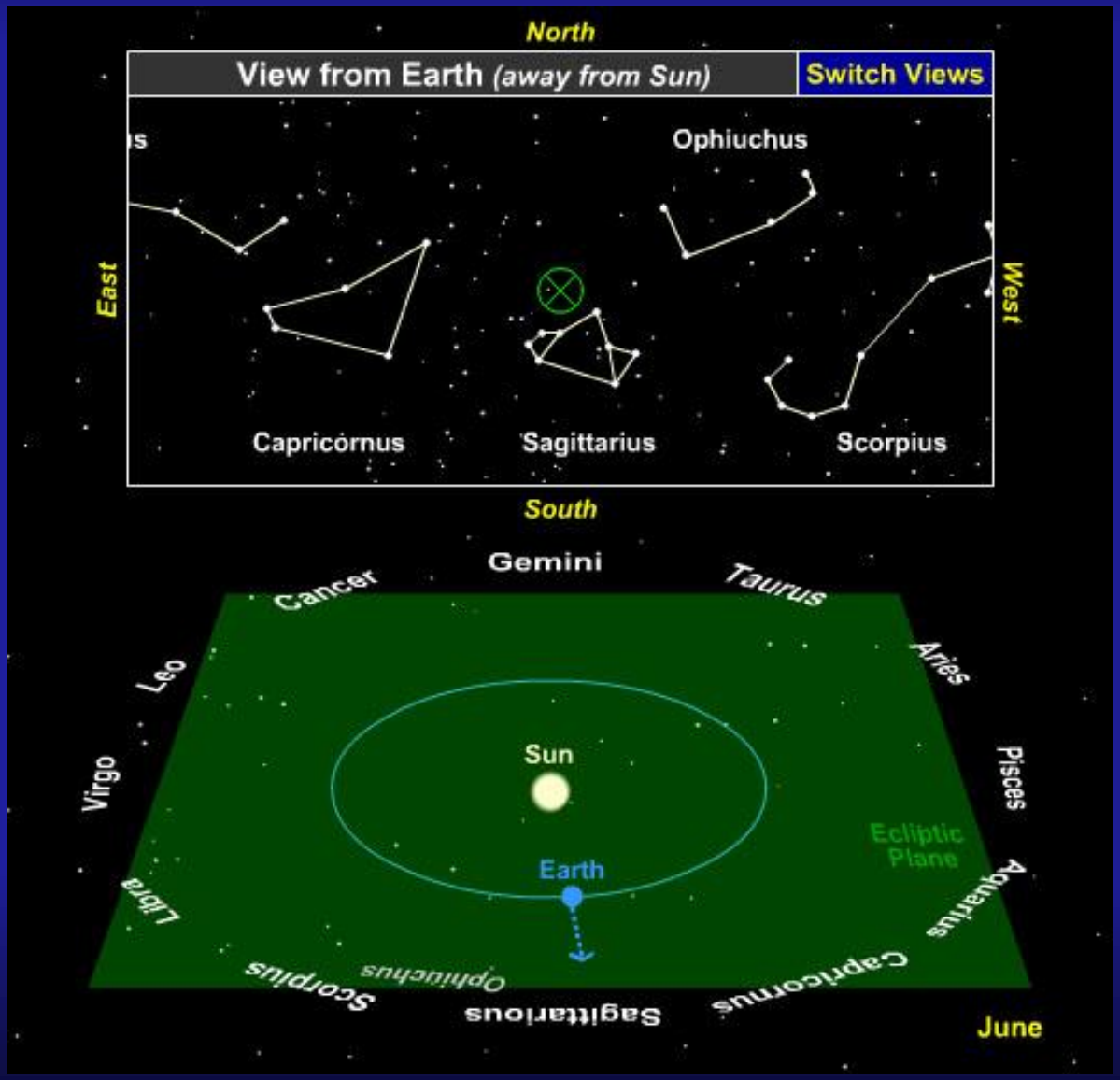
The Sun – Days, part 1

One Sidereal Day



Solstice/Equinox etc.

The Sun's Motion



ABCD

The Sun's apparent position is North of the Celestial Equator in the Summer and South of the Celestial Equator in the winter because:

A. The Moon pulls on the Sun

B. The Earth's orbit is tilted

C. The Sun is tilted and it orbits the Earth

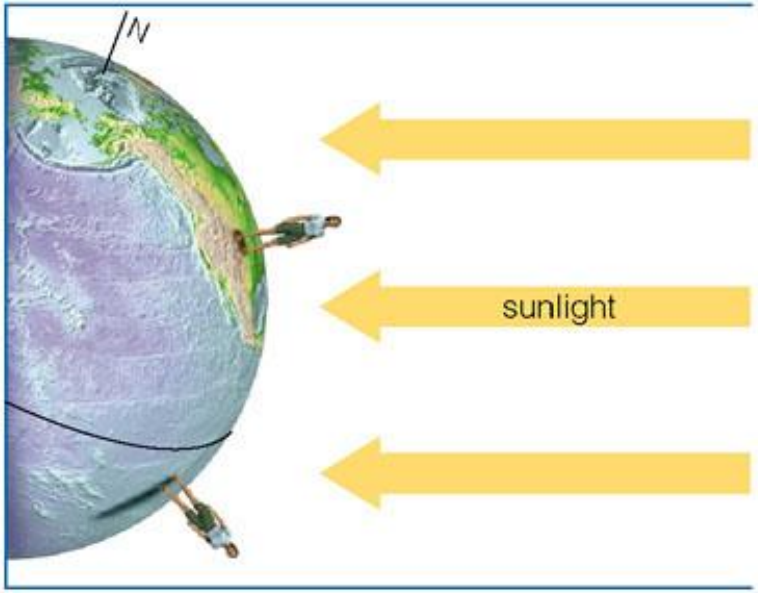
D. The Earth is tilted and it orbits the Sun

Seasons

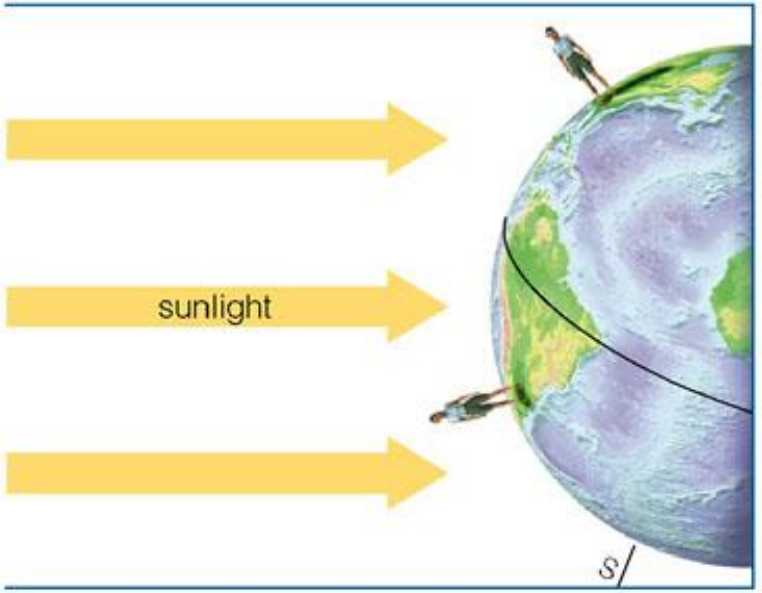
What causes the seasons?

Seasons

Why does the Earth's tilt matter?



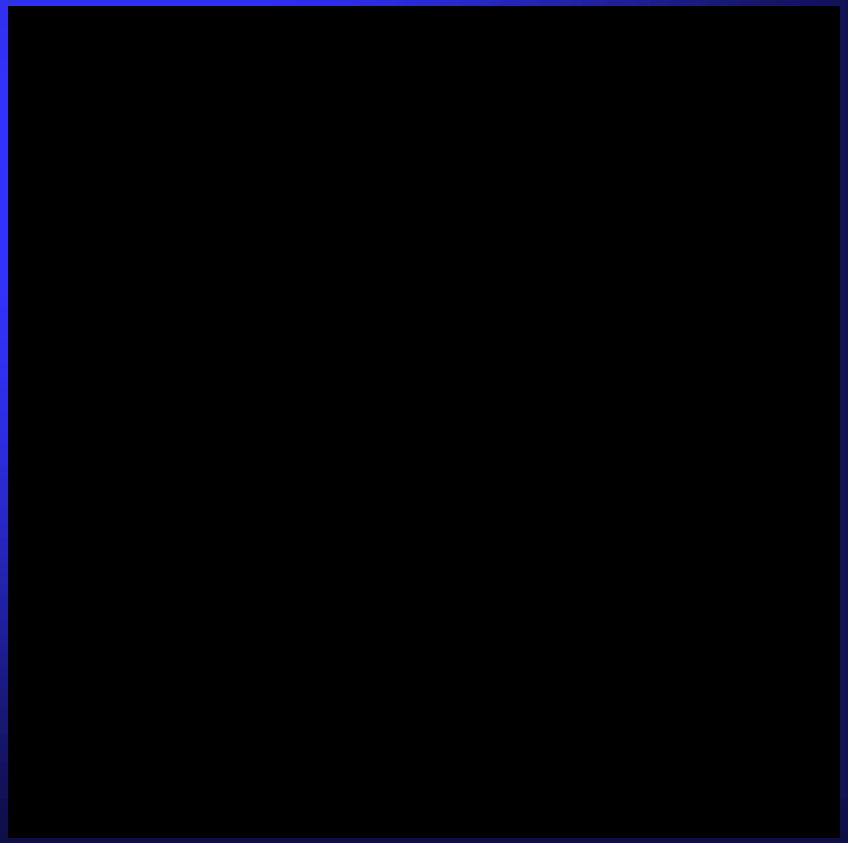
Summer Solstice: Midday sunlight strikes Earth more directly in the Northern Hemisphere—meaning the Sun is higher in the sky and casts smaller shadows—than in the Southern Hemisphere.



Winter Solstice: The situation is reversed from the summer solstice, with midday sunlight striking the Southern Hemisphere more directly and the Northern Hemisphere less directly.

Moon: The Dark Side of the

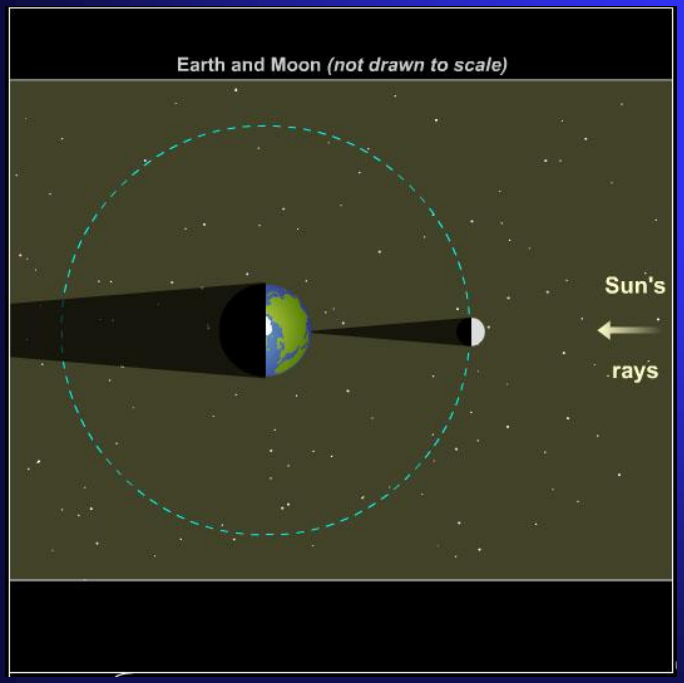
"There is no dark side of the moon really..."

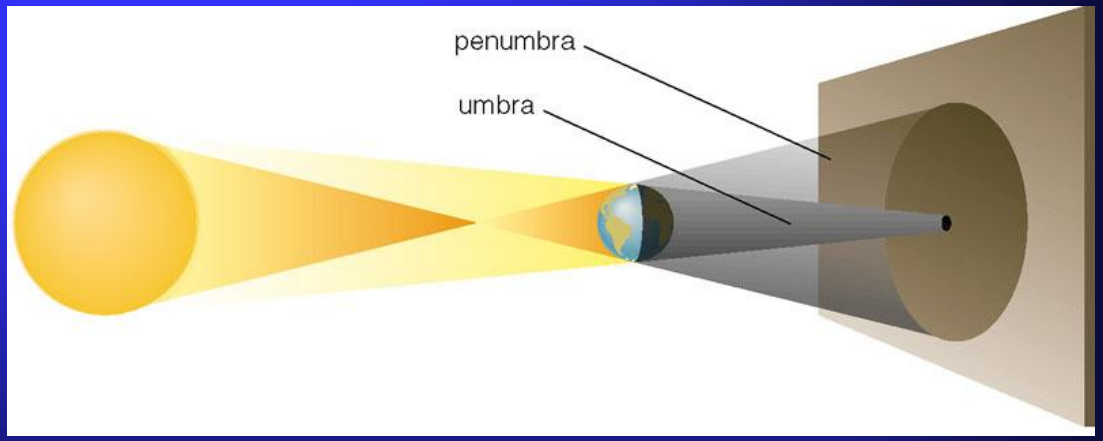


Eclipses

What causes a solar eclipse?

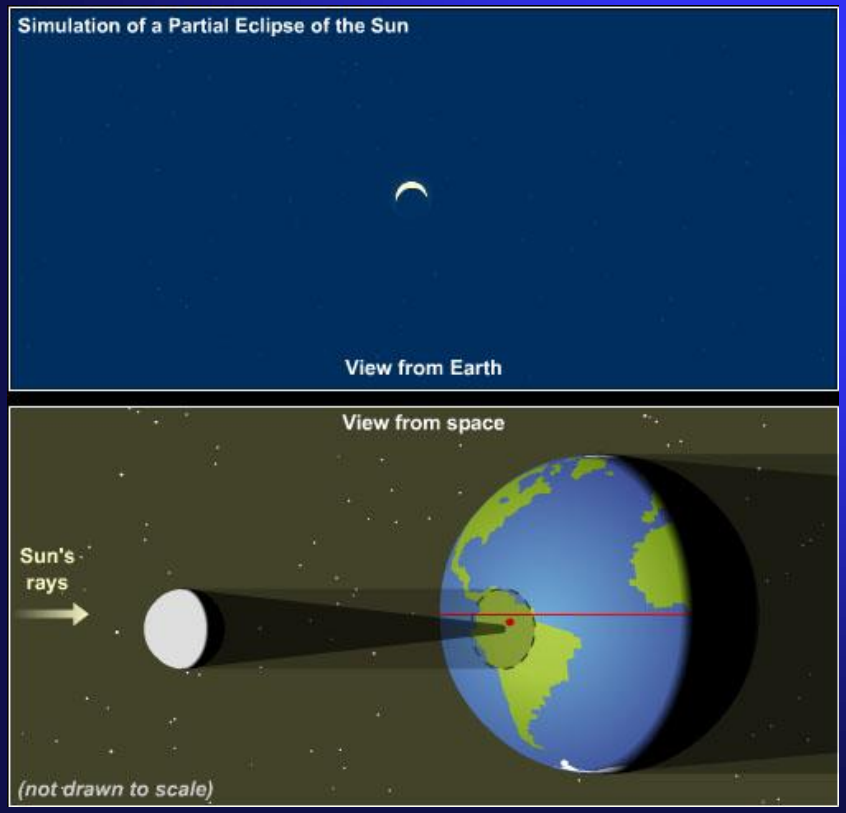
The Moon blocks the Sun.



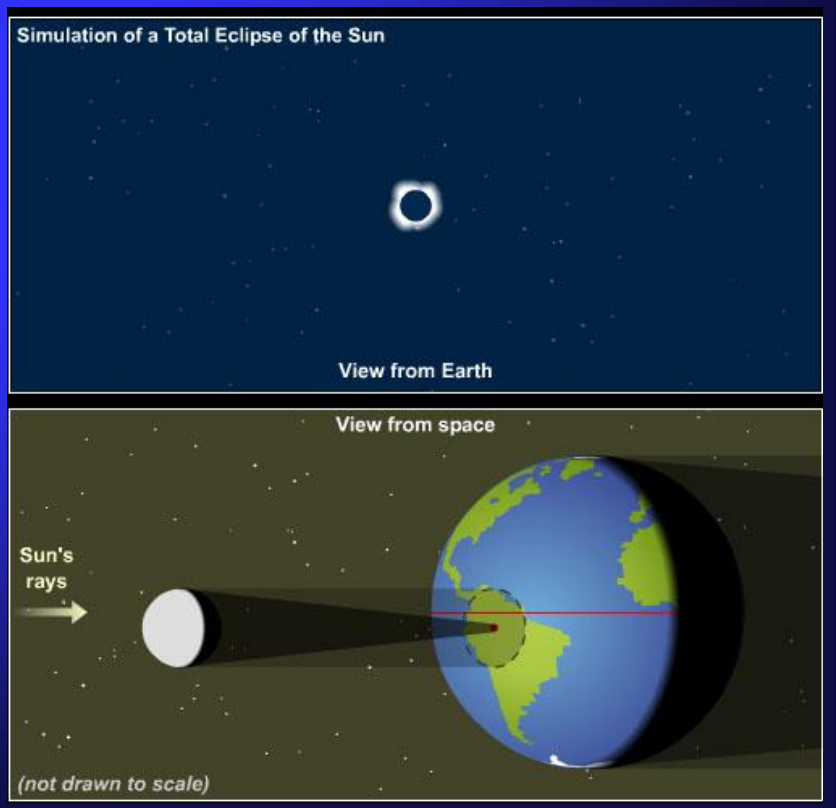


Eclipses

Partial Eclipse
In the **penumbra**



Total Eclipse
In the **umbra**



Eclipses

Shouldn't there be one every month?

The Moon's orbital plane is tilted 5° with respect to the ecliptic