**Introduction to Astronomy:**

**Unit 4: Astronomy**

**Mini-Unit:** Astronomy Basics

**Goal 2: The student will demonstrate the ability to identify and describe the properties, natural forces, and theories of formation and operation of the solar system and universe**

Objectives – The student will be able to:

* + Describe current efforts and technologies used to study the universe, including optical telescopes, satellites, space probes, spectroscopes, high altitude platforms and explain how their research impacts human activity

**Textbook:** Unit 8, Chapters 26, pg. 658

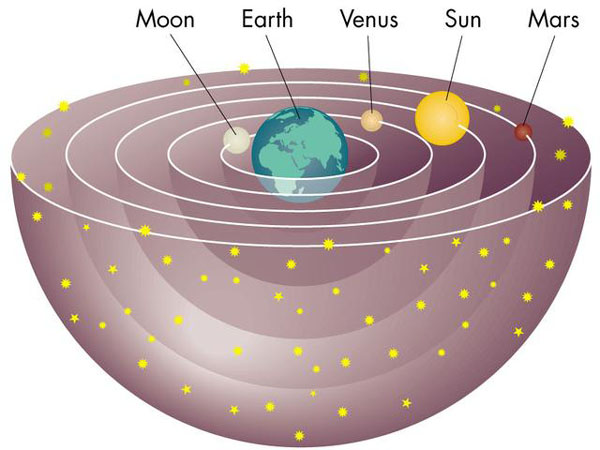
History of Astronomy:

Astronomy:

Originally suggested the universe had:

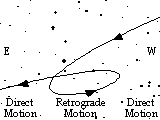
As careful mathematical observations were made, they found the Sun, the Moon, and some of the “stars” did not follow paths that would suggest the above statement

* The “stars” that did not follow the predicted path, rather they “wandered” across the sky, and thus were called “planets”, the Greek word for “wander”

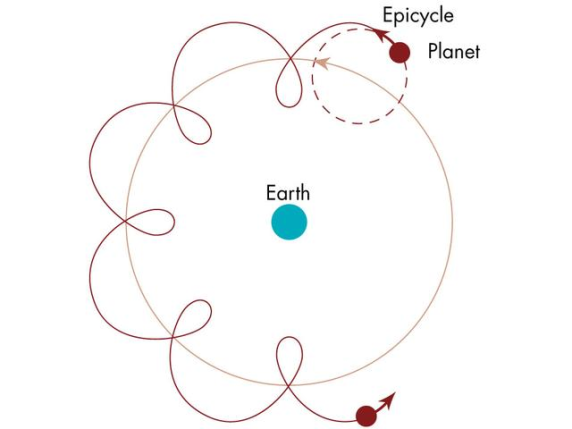


Aristotle’s Theories - ~350 B.C., Greek Philosopher

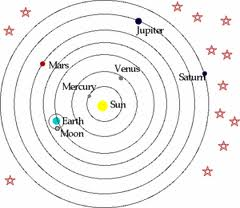
* Motion caused by a supernatural being
* Earth was a sphere (could see shadow on moon during eclipse) and non-moving (because we could not feel it and falling objects would not drop straight down)

Geocentric Universe:

Retrograde Motion:

Ptolemy’s Theories - ~150 A.D., Egyptian astronomer

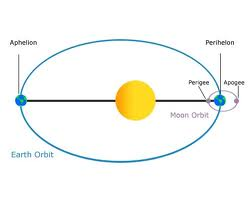
* Geo-centric
* No changes made for a 1,000 years until the inaccuracies in predictions became to big to blame on primitive equipment



Copernicus’ Theories - ~1500’s A.D., Polish priest/mathematician

* Orbits were perfect circles
* Did not publish his findings until his death because it contradicted the Church’s beliefs

Heliocentric Universe –



Tycho Brahe’s Contribution - ~1500’s A.D., Danish nobleman

* Built a top of the line observatory, gathered and kept tremendous amounts of data

Johannes Kepler’s Theories - ~1600’s A.D., Assistant to Brahe

Laws of Planetary Motion:

1. Each planet revolves around the Sun in an elliptical orbit with the sun at one of the foci
2. There is a mathematical relationship between the time it takes a planet to revolve around the sun and its average distance from the sun

Galileo Galilei’s Contribution - ~1600’s A.D., Italian astronomer

* Developed and refined the telescope for viewing distant objects

Astronomy Basics:

The Big Bang Theory:

Universe:

Galaxy:

Solar System:

Astronomical Unit:

Light Speed:

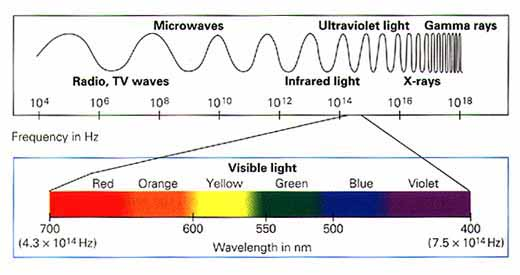
Light Year:

Observing Space:

Electromagnetic Spectrum:

**Longer Wavelengths Shorter Wavelengths**

**Less Energy Most Energy**



Notes on the Electromagnetic Spectrum:

* What we see falls into the visible light spectrum
* Only stars emit visible light, everything else (planets & moons) are reflecting light
* Other instruments can detect the other electromagnetic waves

Telescopes:

Optical Telescopes:

Refracting Telescope: Uses a set lenses to focus light

Reflecting Telescope: Uses a set of mirrors to focus light

Invisible Electromagnetic Radiation Telescopes – used to detect radio waves, gamma rays, X rays, and infrared rays

Space Telescopes – Telescopes that were launched into space to escape obstruction from the Earth’s atmosphere (Hubble Telescope