

ASTR1: PART I: HISTORY & THE NIGHT SKY

- Hierarchy of astronomical objects (which is larger galaxy or supercluster?)
- AU/Light-year definition and numerical values
- Universe Age/Size
- Nearest star name/distance
- Milky Way number of stars
- Number of stars/galaxies in universe
- What does looking back in time mean?
- Period of Earth's rotation and orbit.
- Cosmic calendar; when did human civilization appear?
- Describe the celestial sphere
- Constellation vs asterism
- Number of constellations
- Terms: horizon, zenith, meridian, ecliptic
- Why do stars appear to rise and set; $E \rightarrow W$
- Describe what is the zodiac
- Number of constellations making up the zodiac
- North Star name/how it relates to latitude
- What causes seasons? Hint: $23\frac{1}{2}$ degrees
- Describe how direct sunlight and altitude of the Sun affect temperature?
- What and when are the solstices and equinoxes?
- What is precession? Cycle of precession in yrs?
- How will precession change our north star?
- Why can we see the moon if it does not shine?
- Why do we see phases of the moon? And be able to identify phase from diagram (like in activity)
- Moon's orbital period/cycle in days
- What is synchronous rotation?
- Why/when does a lunar/solar eclipse occur
- Why doesn't an eclipse occur every full moon? Hint tilt 5 degrees.
- Describe apparent retrograde motion
- What is stellar parallax?
- Why did Greeks reject real explanation of planetary motion?
- Why study astronomy?
- Why are tracking seasons very important?
- How did ancient civilizations keep track of time? (how do we determine a day, month, year)
- Why are there 7 days in a week?
- 2 axioms for the scientific method
- How did Eratosthenes measure the Earth?
- Describe the models of the early Greeks, Ptolemaic, Copernicus, Brahe and Kepler. Specifically address if it is helio/geo centric and the path of the planets.
- What main contributions did Tycho Brahe make?
- Describe Kepler's three laws of planetary motion
- Describe the ways Galileo solidified the Copernican revolution.
- What did Galileo determine by observing the phases of Venus?
- What did Galileo discover by observing Jupiter?
- What are the 3 hallmarks of science?
- Newton's three laws of motion
- Why is Newton's generalization of Kepler's 3rd so important?
- How does gravity cause tides?
- When will we have the largest tides?
- Why does the moon always show us the same face?
- What is meant by the dual nature of light?
- What wavelengths are longer and shorter than visible light? i.e. radio, microwaves, infrared, ultraviolet, x-rays, and gamma rays.
- How is wavelength and frequency related?
- How is wavelength and energy related?
- Discuss the 4 ways light interacts with matter.
- What are the 3 different types of spectra?
- How is temperature and color related?
- Explain the Doppler effect.
- Blue/red shift vs short/long wavelengths vs moving towards/away.
- Why are telescopes useful to help us learn about the universe.
- Why put telescopes in space?
- What is adaptive optics?