

ASTR1: PART I & II REVIEW

PART I

CH1 Summary: View of the Universe

- Hierarchy of astronomical objects (which is larger galaxy or supercluster?)
- AU/Light-year definition and numerical values
- Universe Age/Size
- What makes up the S.S.
- Size of S.S. 1:10billion scale
- Nearest star name/distance
- Milky Way size Ly/ # of stars
- Number of stars/galaxies in universe
- What does looking back in time mean?
- How did universe begin
- Composition of early universe
- Where did heavier elements come from? (describe stellar recycling)
- Period of Earth's rotation and orbit.
- Location of S.S. in Milky Way
- Period of Galaxy Rotation
- How do we know universe is expanding?
- Cosmic calendar; when did human civilization appear?

CH2 Summary: Discovering the Universe

- Describe the celestial sphere
- Constellation vs asterism
- Number of constellations
- Terms: horizon, zenith, meridian, ecliptic
- Why do stars appear to rise and set; E→W
- Describe what is the zodiac
- Number of constellations making up the zodiac
- What 2 things do constellations we see depend on?
- Latitude N←→S, Longitude E←→W of equator
- North Star name/how it relates to latitude
- What causes seasons? Hint: 23½ 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?
- What are the 2 conditions needed for an eclipse
- 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?

CH3 Summary: The Science of Astronomy

- Describe scientific thinking
- Why study astronomy? 3 main reasons why.
- 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?
- Describe the main 3 reasons why modern science traces its roots to the Greeks?
- What are the 3 philosophical innovations of the Greeks
- 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 3 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?
- What is a scientific theory?

PART II

CH4 Summary: Making Sense of the Universe “Laws of Physics”

- What are the three basic types of motion?
- Momentum, acceleration and force all depend on?
- Mass vs weight
- In what major way did Newton change our view of the universe? Hint: one universe
- Newton’s three laws of motion
- What are the 3 conservation laws in Astronomy?
- Explain what keeps a planet orbiting
- What are the three basic types of energy? What type is thermal? What type is gravity? What type is light?
- Know the first condition of the universal law of gravity
- How will changing Mass or Distance effect gravity?
- Discuss three ways Newton’s law of gravity extends to Kepler’s law
- Why is Newton’s generalization of Kepler’s 3rd so important?
- What happens if you lose or gain orbital energy?
- What is escape velocity?
- How does gravity cause tides?
- When will we have the largest tides?
- Why does the moon always show us the same face?

CH5 Summary: Light

- 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?
- What is matter?
- What are atoms made of?
- Know what changes and what stays the same with different isotopes.
- Discuss the 4 ways light interacts with matter.
- What are the 3 different types of spectra?
- Explain how light tells us what things are made of.
- How is temperature and color related?
- Explain the Doppler effect.
- Blue/red shift vs short/long wavelengths vs moving towards/away.
- 3 reasons telescopes are useful to help us learn about the universe.
- Why put telescopes in space? Hint 3 reasons.
- What is adaptive optics?