

Chapter 3

Vocabulary

Visible Light	Waves	Crest
Trough	Period	Wavelength
Amplitude	Frequency	Spectrum
Nanometer	Proton	Electron
Neutron	Electric Field	Magnetic Fields
Electromagnetism	Speed of Light	Electromagnetic Spectrum
Temperature	Blackbody	Wein's Law
Stefan's Law	Doppler Effect	Radial Velocity

- Know what electromagnetic radiation is
- Know what the most familiar part of the electromagnetic radiation is
- Know that electromagnetic radiation moves in waves
- Know what crests and troughs are
- Know what is meant by wavelength
- Understand what the amplitude and frequency are
- Know what white light is
- Know what we use a prism for
- Know what the spectrum is
- Know what units we use to measure wavelengths
- Know what light has the longest and shortest wavelengths
- Know the parts of the atom
- Know what the electric field is
- Know what magnetic fields are
- Understand what electromagnetism is
- Know what the speed of light is
- Know what the electromagnetic spectrum is
- Know what 2 parts of the EMS reaches the ground easily
- Understand what temperature is
- Know what is meant by Blackbody or Blackbody curve
- Know what Wein's law is
- Understand how the energy varies according to Stefan's law
- Know what the Doppler Effect is and how it is used in astronomy
- Know what radial velocity is

Ch 4 Spectroscopy

Vocabulary

Spectrum	Spectroscope	Diffraction Grating
Continuous Spectrum	Emission Spectrum	Absorption Spectrum
Fraunhofer Lines	Helios	Atom
Proton	Nucleus	Electron
Shell	Ground State	Orbitals
Ionized	Excited State	Photons
Fluorescence	Chemical Bonds	Rotation
Vibration	Line Broadening	Zeeman Effect

- Know what a spectrum is

- Know what a spectroscope is and how the diffraction grating is used
- Know what a continuous spectrum is
- Know what an emission spectrum is and how it is formed
- Know what an absorption spectrum is and how it is formed
- Understand what is meant by the Fraunhofer lines and where they come from
- Understand what Kirchoff's Laws say
- Know what element was discovered on the Sun before it was seen on Earth
- Know the different parts of the atom, where they are found, and the charge on each part
- Understand the concept of the ground state, excited state and ionization
- Know what a photon is
- Know how photon energy is calculated
- Know that light acts both as a wave and a particle
- Know the 2 ways a hydrogen electron may fall back to the ground state and what is emitted in both ways
- Know what fluorescence is
- Understand that a molecule is held together by chemical bonds
- Know what is emitted by a molecule when you have an electron transition or rotation or vibration
- Know what can be determined from the spectrum of some object
- Understand that more complex atoms may have any number of possible transitions with all of those electrons
- Understand that the number of atoms can determine the width of a spectral line
- Understand how higher temperatures can affect the spectrum
- Know what line broadening is and how it may occur
- Know how a magnetic field may affect the width of spectral lines (Zeeman Effect)

Chapter 5 Telescopes

Vocabulary

Optical Telescopes	Reflector	Refractor
Primary Mirror	Secondary Mirror	Focal Length
Newtonian Telescope	Cassegrain Telescope	CCD
Pixels	Coma	Schmidt-Cassegrain
Photometry	Light Gathering	Resolving Power
Angular Resolution	Diffraction Limits	Adaptive Optics
Interferometry	Infrared Telescopes	Ultraviolet Telescopes

- Understand what is meant by the term optical telescope
- Know the difference between the 2 main types of telescopes: reflectors and refractors
- Know what a primary mirror and secondary mirror is
- Know what is meant by the focal length
- Know why as telescopes have gotten bigger, reflectors are better than refractors
- Understand several different types of reflectors: Newtonian, Cassegrain, and Nasmyth
- Know what a CCD is and why it is better than film

- Know what pixels are and why more is better
- Know why we do image processing
- Know how coma affects the views and how the Schmidt-Cassegrain solves that
- Know what photometry is and why we do it
- Know what is meant by light gathering ability and resolving power is
- Understand how we determine the area of a mirror and how much more light a telescope that is 2x as big as another telescope will gather
- Know which telescopes are the largest in the world
- Know what is meant by angular resolution and diffraction limits
- Know how the wavelength affects the diffraction limits
- Know how atmospheric blurring can occur
- Understand the concept of adaptive optics
- Understand what radio astronomy is
- Understand why radio telescopes are so big and how their angular resolution compares with optical telescopes
- Know why we can use a radio telescope 24 hours a day and why radio astronomy has an advantage over optical telescopes
- Understand the concept of interferometry
- Know what the Very Large Array is
- Understand why we must put some telescopes in space
- Know that infrared, UV, and X-rays telescopes are in space
- Understand how the mirrors are set in the Chandra X-ray Telescope