Lecture Notes for 9/18/02

Gravity and Motion

FOR EXAM: F.Y.I. Bring ID; know ID #, bring a pencil.

* Inertia:
  Tendency of an object at rest to remain at rest and an object in motion to keep moving. (Amount of Mass)
  - perpensity of an object to obey Newton's 1st Law.
* Gravity – specific force (CENTRIPETAL FORCE)
  produces circular motion = planets moving around the Sun

* Just as the Sun pulls on the Earth
  the Earth pulls on the Sun –
  Mass of the Sun keeps the two from running into each other

* Orbital Motion is not uniform because
  things are always changing (i.e. direction)

* Surface Gravity – (your weight)
  - It varies
  - Closer you are to the planet (→CENTER) the more gravitational attraction is
  - Determines gravitational force of planet on object = weight of object

* Escape Velocity –
  - Amount of speed and energy needed to disassociate yourselfs with the earth
  - rocket has to reach a minimum of 17,600 mph to get to outer space
  - speed needed to move away from an object and not fall back

Launch – always to east = earths rotation (Spin of the earth → head start)
– always closer to equator
– mostly done in the east (Something goes wrong → lands in ocean)

- Important in determining whether planet has atmosphere and for black holes

Looking For →
- Black holes – intense radiation (stuff being sucked in)
  - not able to see anything

F.Y.I. Not Information for Exam 1

Light and Atoms

Light = photon; wavelengths coming from the sun;
high frequency is electromagnetic wave
- part of the electromagnetic spectrum

Electromagnetic Spectrum
- That's how we receive all the information we have
- all objects emit Electromagnetic Radiation

Properties of Light:
- both partical and wave light properties
- Longer wavelengths, lower frequencies = Wave light dominates
- Shorter wavelengths, longer frequencies = partical light dominates

- Electromagnetic Waves — transport Energy

- Atoms — all visible light comes from a photon and excitement with electrons decay, emit visible light

- Light from the Sun:
  - surrounded by hot gases - atoms emit protons
  - all visible lights comes from a transition from the electronic shell of an atom.

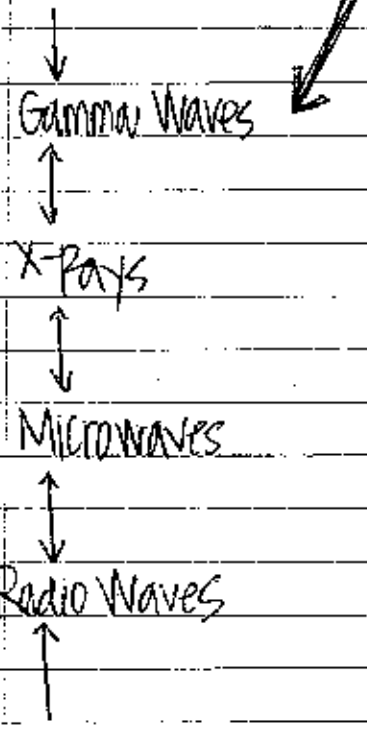
- Wien's Law: A color

Graph = Intensity - is relative = (units don't make any difference)
Wavelength: nanometer — billionth of a meter
(Kelvin = temperature)
(Hugo Pho-Paw =
- heat object up it has colors that are associated with what it is
- all colors → WHITE (red, yellow, green, blue, purple)

heat →

longer wavelength
low frequency, low energy = radio waves
low visible light

more visible light, more energetic = X-rays
Gamma Rays



- Types of Spectra
  Spectrocity = looking at the radiation an object is emitting.

Astronomy Interest
1. Emmission
2. Absorption
3 Continious