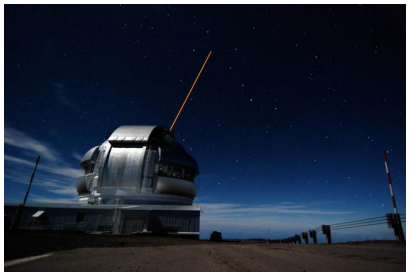
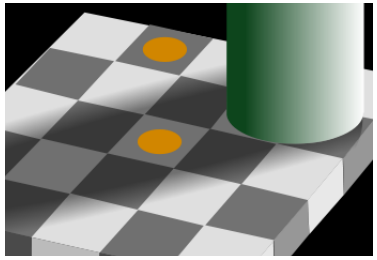
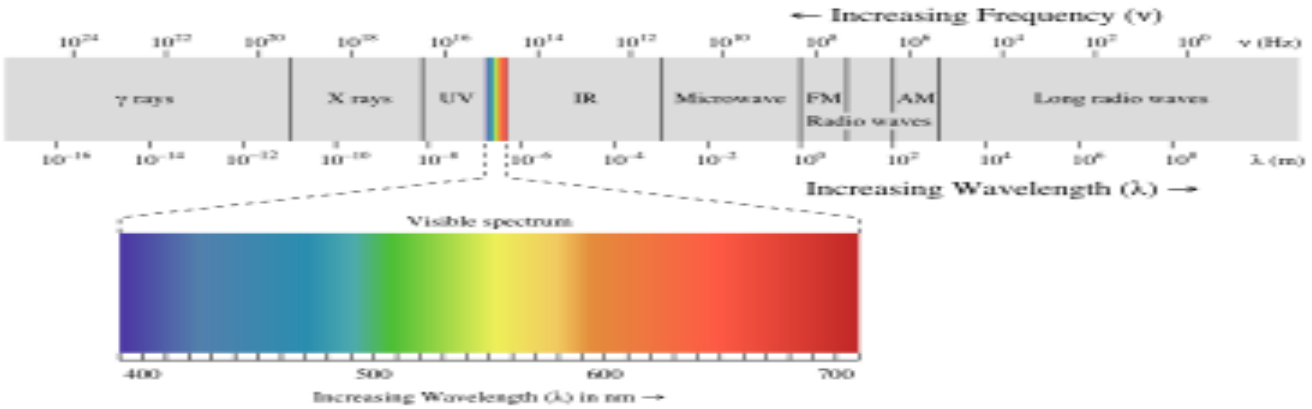
Physics 1230: Light and Color



Study Guide for Midterm 1

in class, Thursday, February 20

http://www.colorado.edu/physics/phys1230/

Logistics

Format:

- in class (our usual lecture room), 11am – 12:15pm
- one 2-sided crib sheet
- multiple choice questions + (maybe) a few short-answer questions
- closed-book, closed-notes

What's covered:

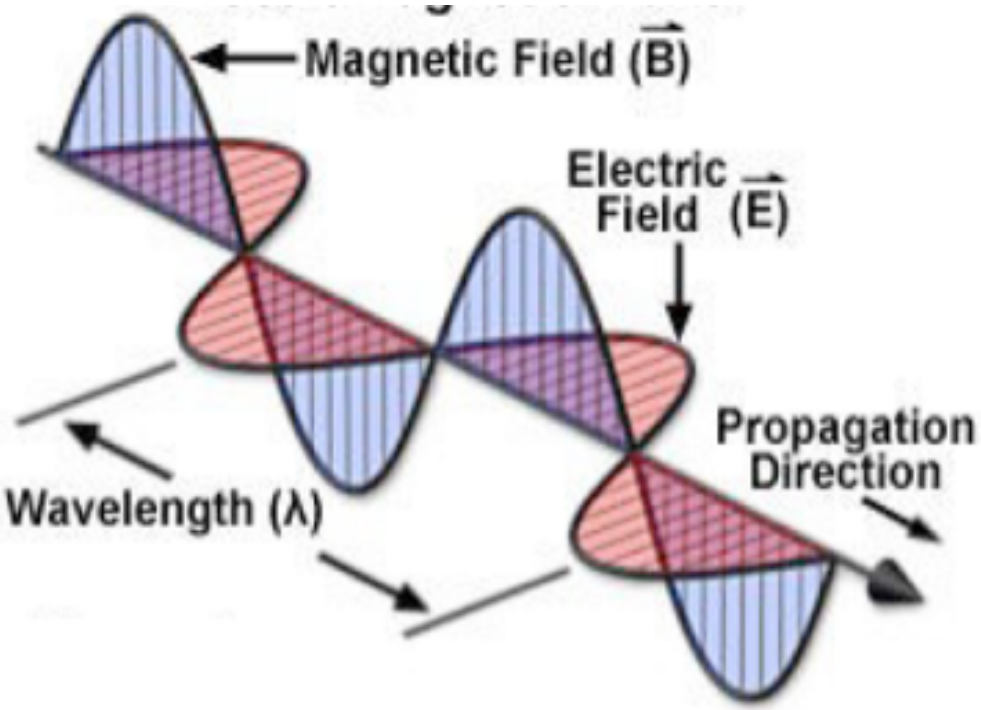
- lectures 1-5 (posted on the class website)
- text "Seeing the Light", Ch. 1 and Ch. 2
- homeworks 1 – 4

Topics covered - 1

What is light?

- scientific notation
- charges -> electric and magnetic fields
- force on a charge due to E and B fields
- electromagnetic waves
- spectrum
- generating different

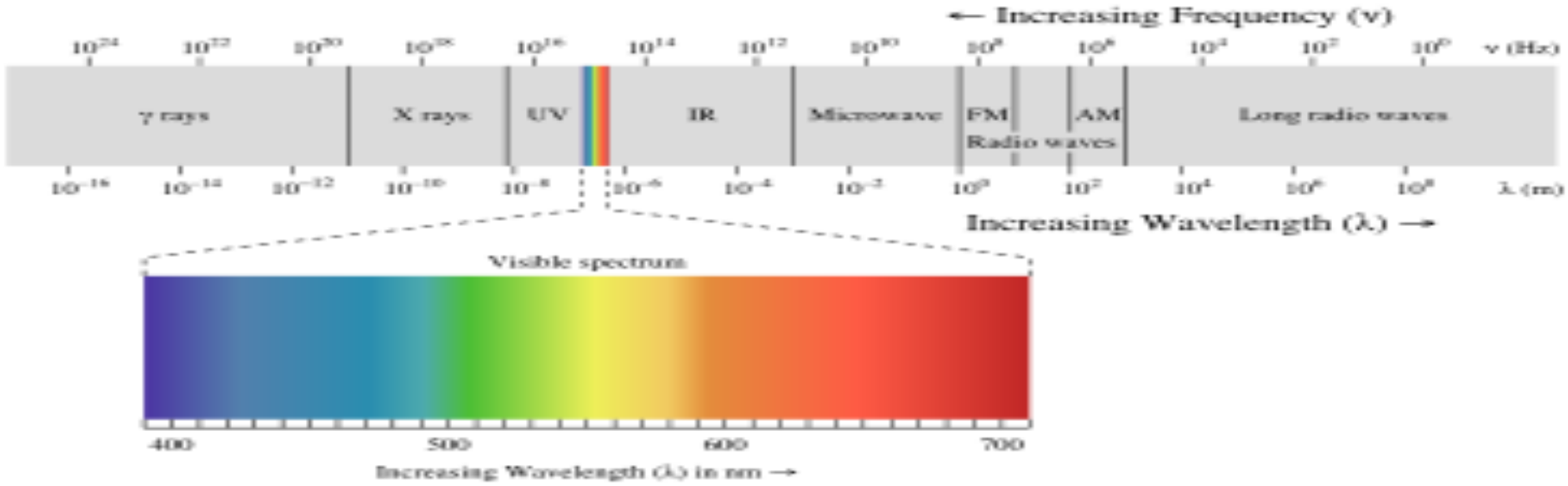
  types of EM radiation



Topics covered - 2

Fundamentals of EM waves

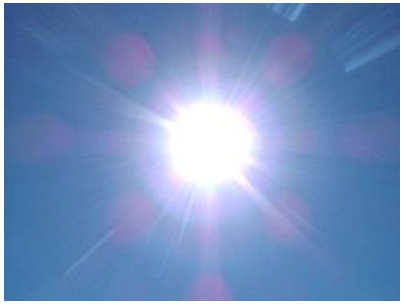
- EM waves in vacuum
- properties of light: wavelength, frequency, speed,...
- electromagnetic spectrum
- blackbody radiation
- color
- quantum picture of light: photons



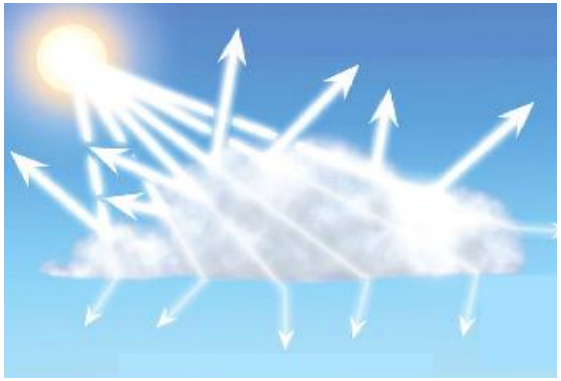
Topics covered - 3

Light propagation

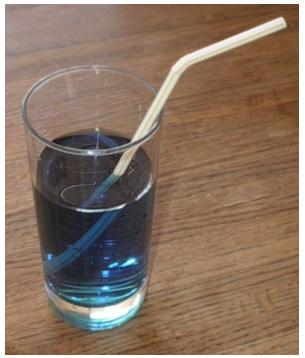
- from wave to ray picture



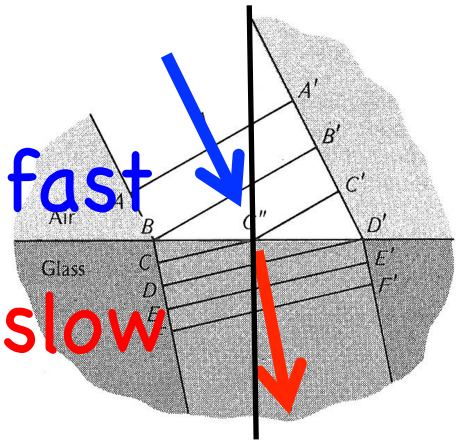
- shadows and apertures
- scattering



- reflection



- refraction



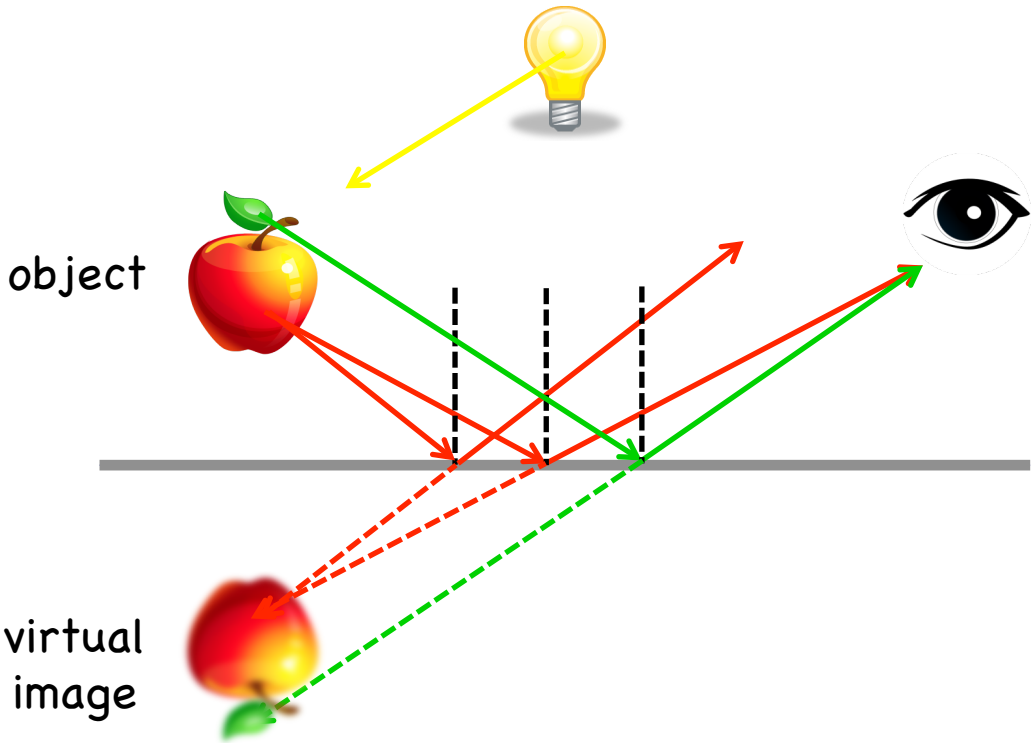
- diffraction

- absorption

Topics covered - 4

Image formation: mirrors & mirages

- real and virtual images
- image due to reflection: plane mirror
- image due to refraction: mirage, rainbow, sun columns



- The *virtual* image is in the same place regardless of the location of the viewer
- The image is called *virtual* because no real rays reach the image, and it cannot be seen by putting a screen at its position

How to prepare

- review all the lecture notes
- reread Ch.1 and Ch.2 carefully, including summary
- review homework problems and their posted solutions