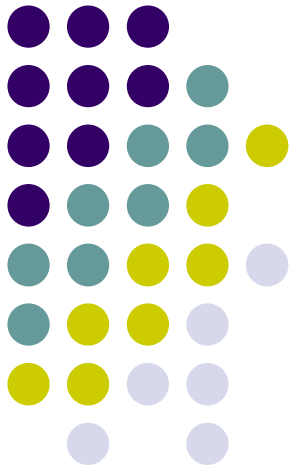
ARTRICKS

OPTRICKS

EX-I-09
Shih Chieh Huang

Huang, born in Taipai and educated in the United States, is an internationally exhibited new media artist whose recent exhibitions include the 2007 Venice Biennale and the U.S. electronic arts festival “01.” Drawing from the well of remix culture, Huang combines stripped electronic parts from the everyday objects that comprise our modern existence and creates a fully inhabited, interactive world that is both obviously familiar and strangely foreign.

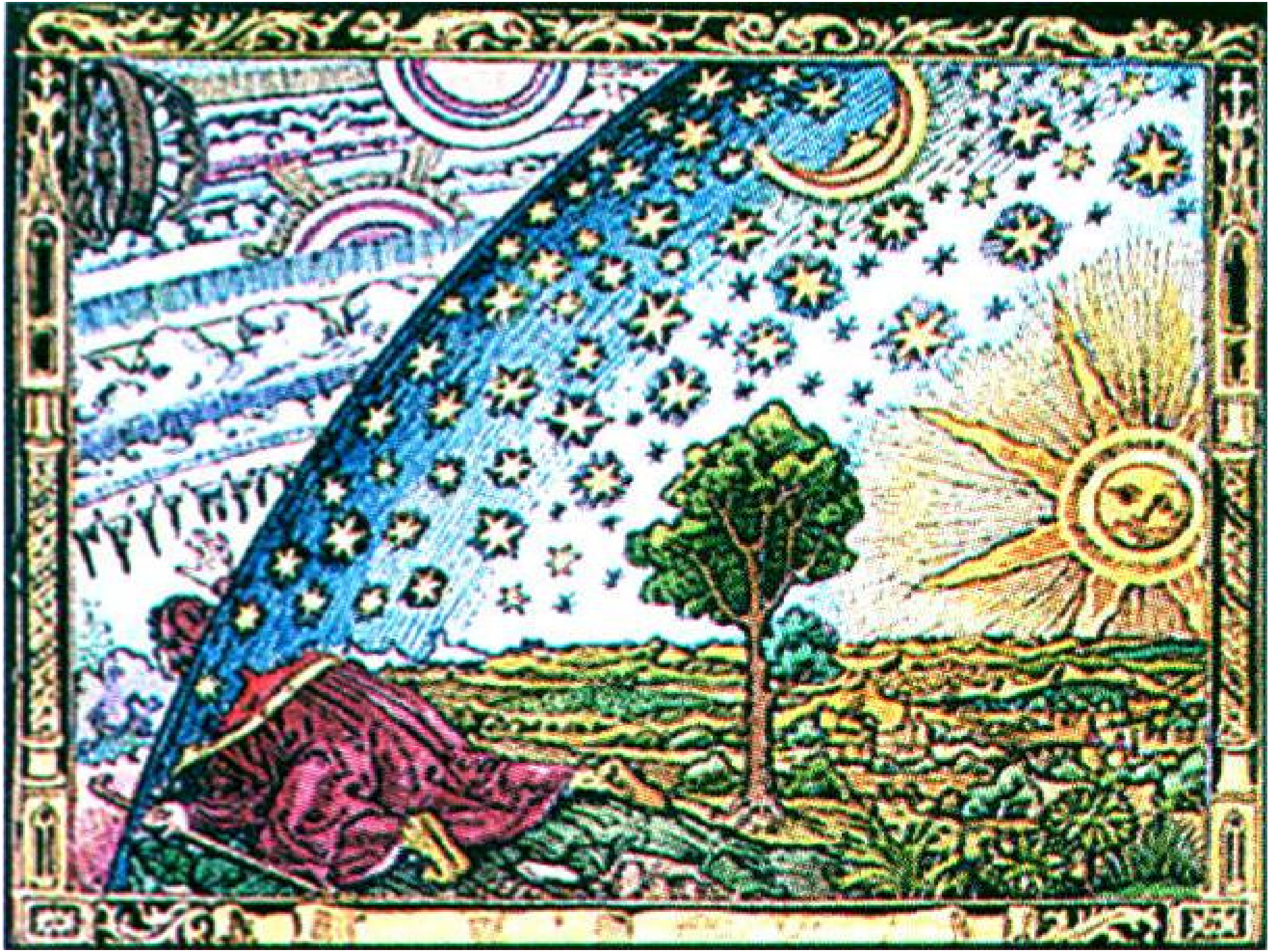


Donn M. Silberman
Founding Director
The Optics Institute
Of Southern California

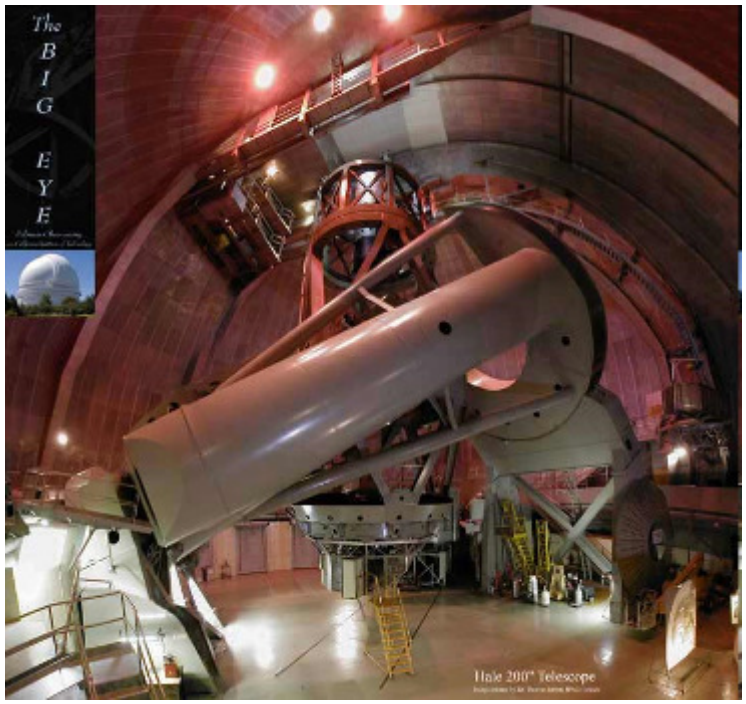
Beall Center
For Art + Technology
University of California, Irvine
Family Day, April 18, 2009
11:00 am to 3 pm

The X-Light

Colors moving in Space-Time



ART



TECHNOLOGY

Powers of Ten Screen Saver.lnk

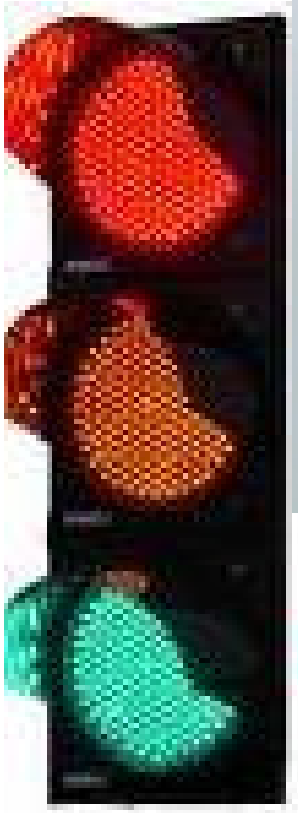
Art + Technology

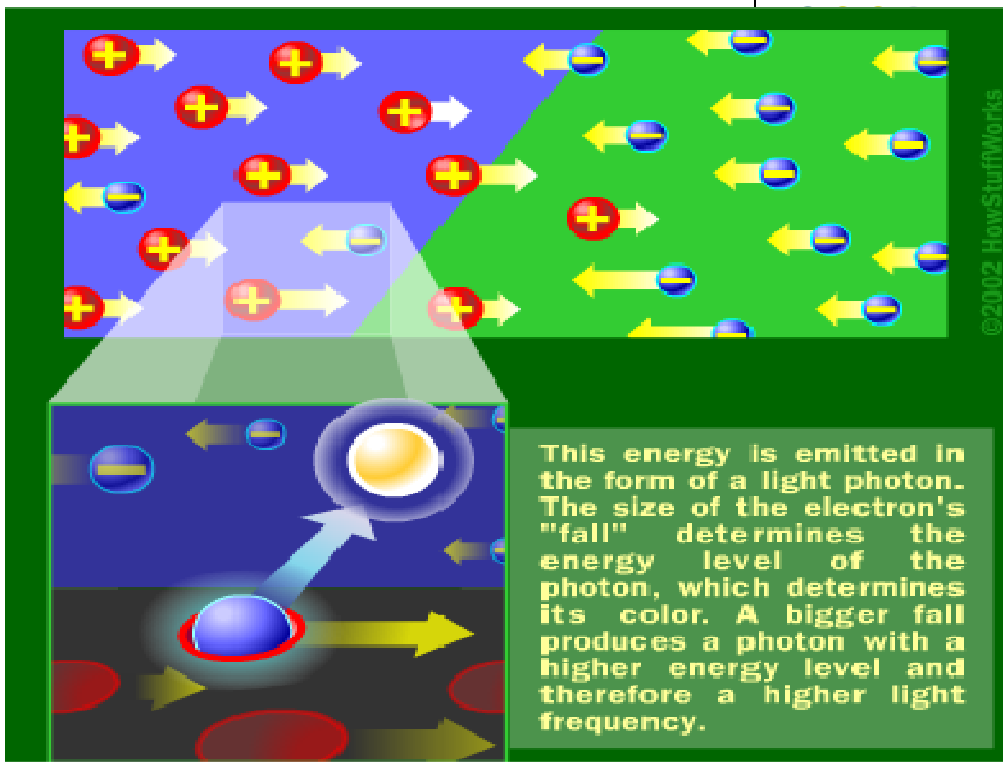
- Artists have always used ‘Technology’
- Some technologies have been around for hundreds of years.
- Some technologies are new
- Some are now called:
  “New Media” or “Digital”

- Anyway you look at ‘it

IT IS ALL ART!!

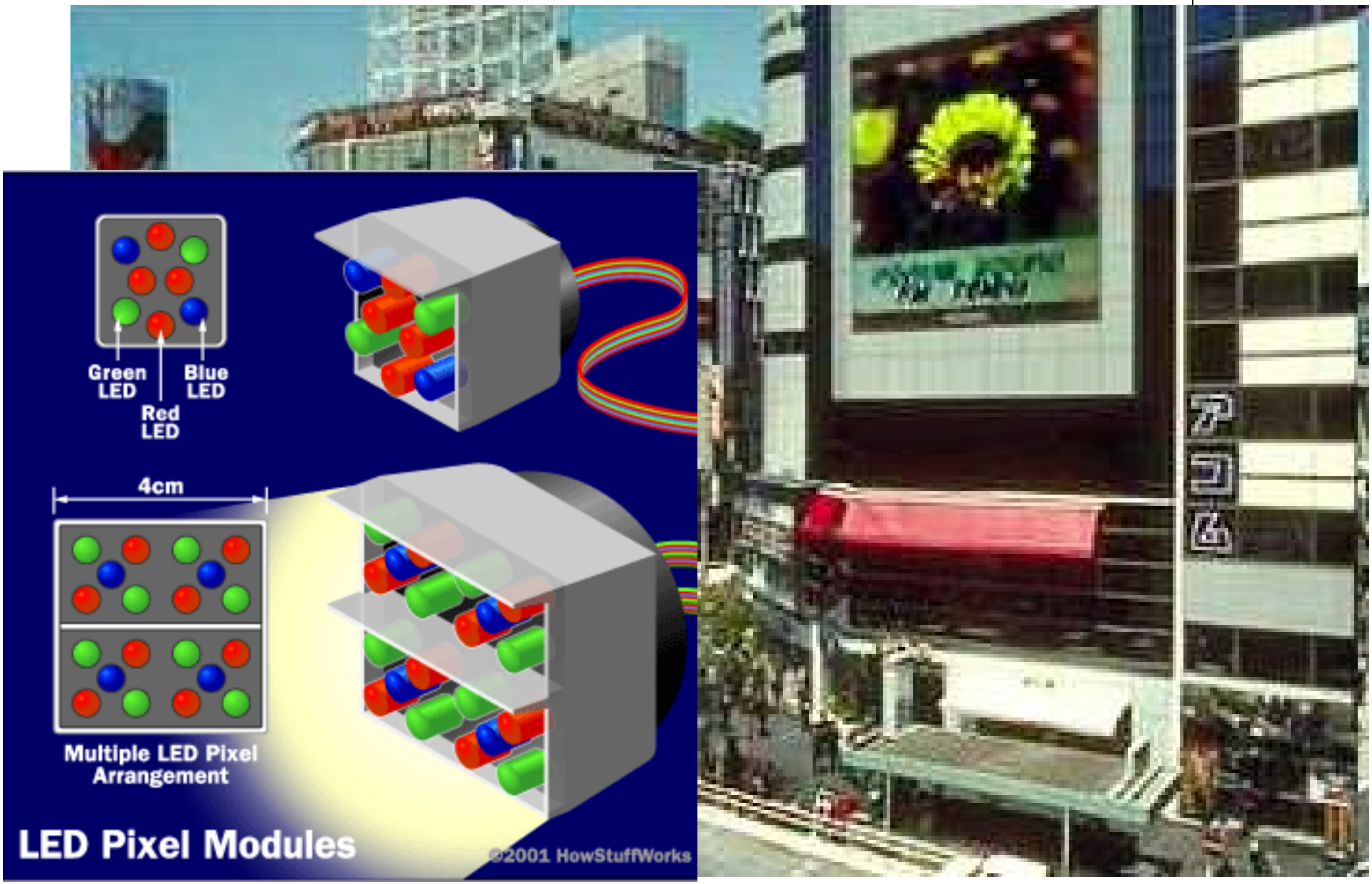
Light Emitting Diodes - LEDs

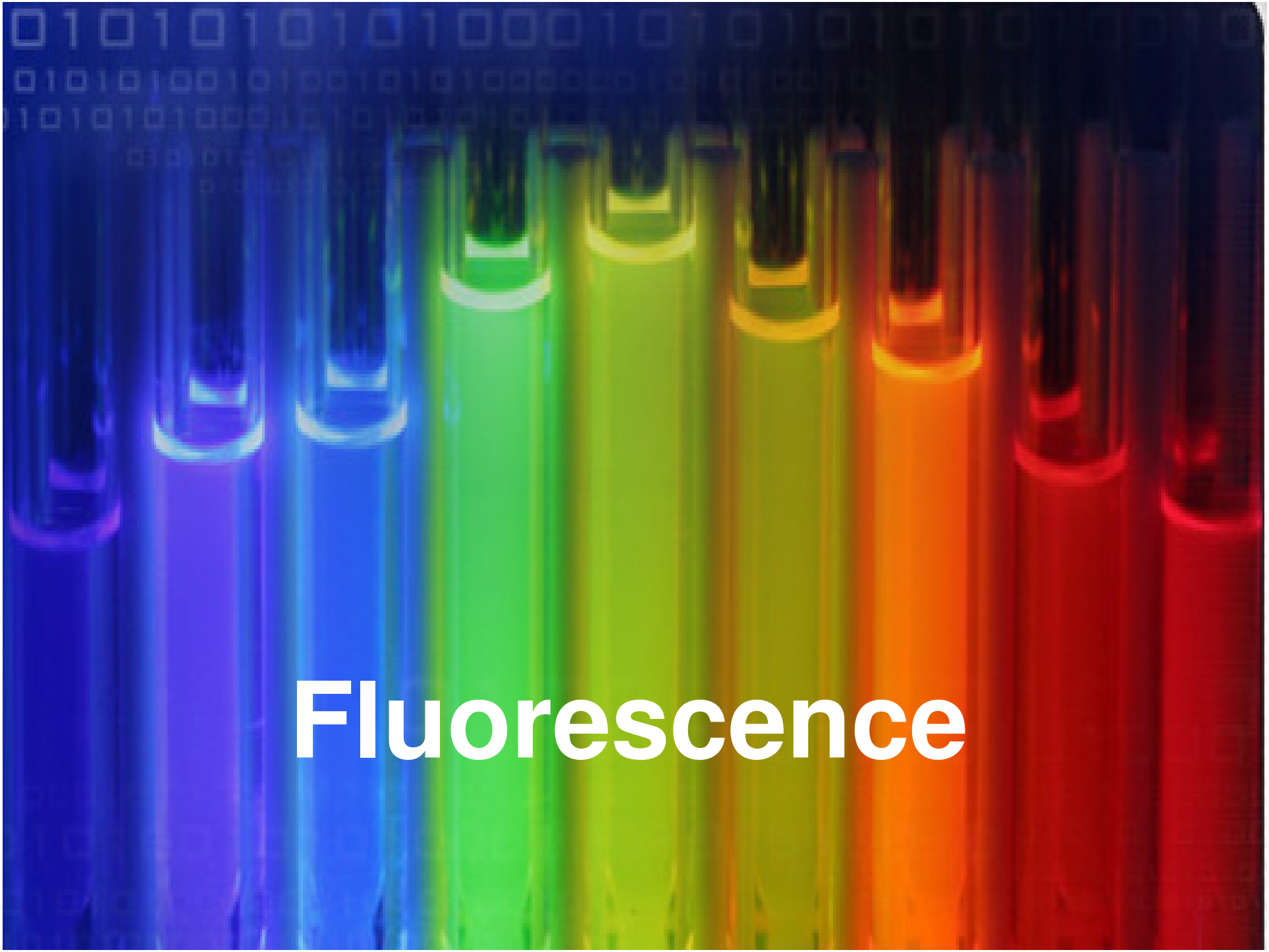




http://electronics.howstuffworks.com/led.htm

Light Emitting Diodes - LEDs




Fluorescence

Absorption and Emission of Radiation

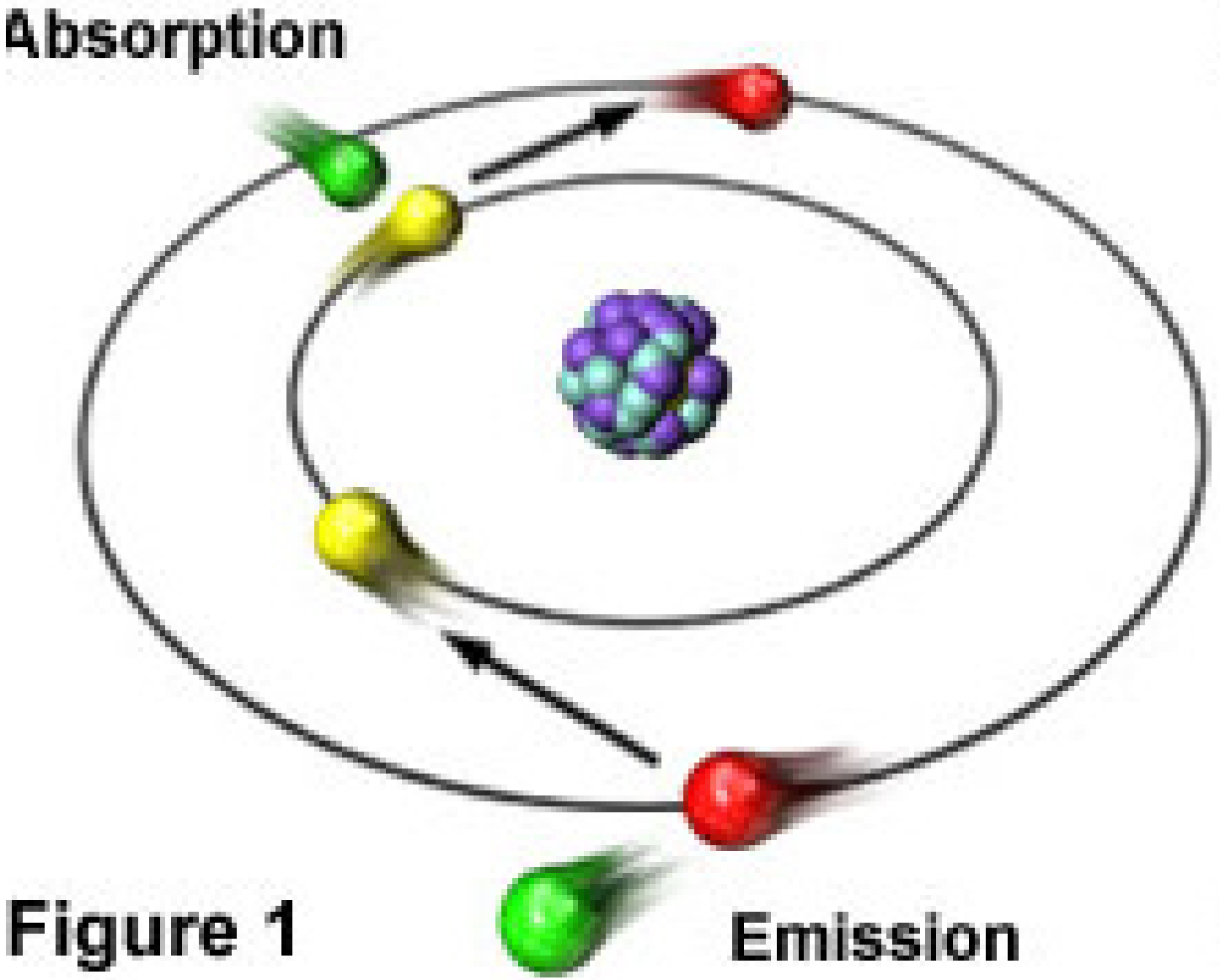


Figure 1

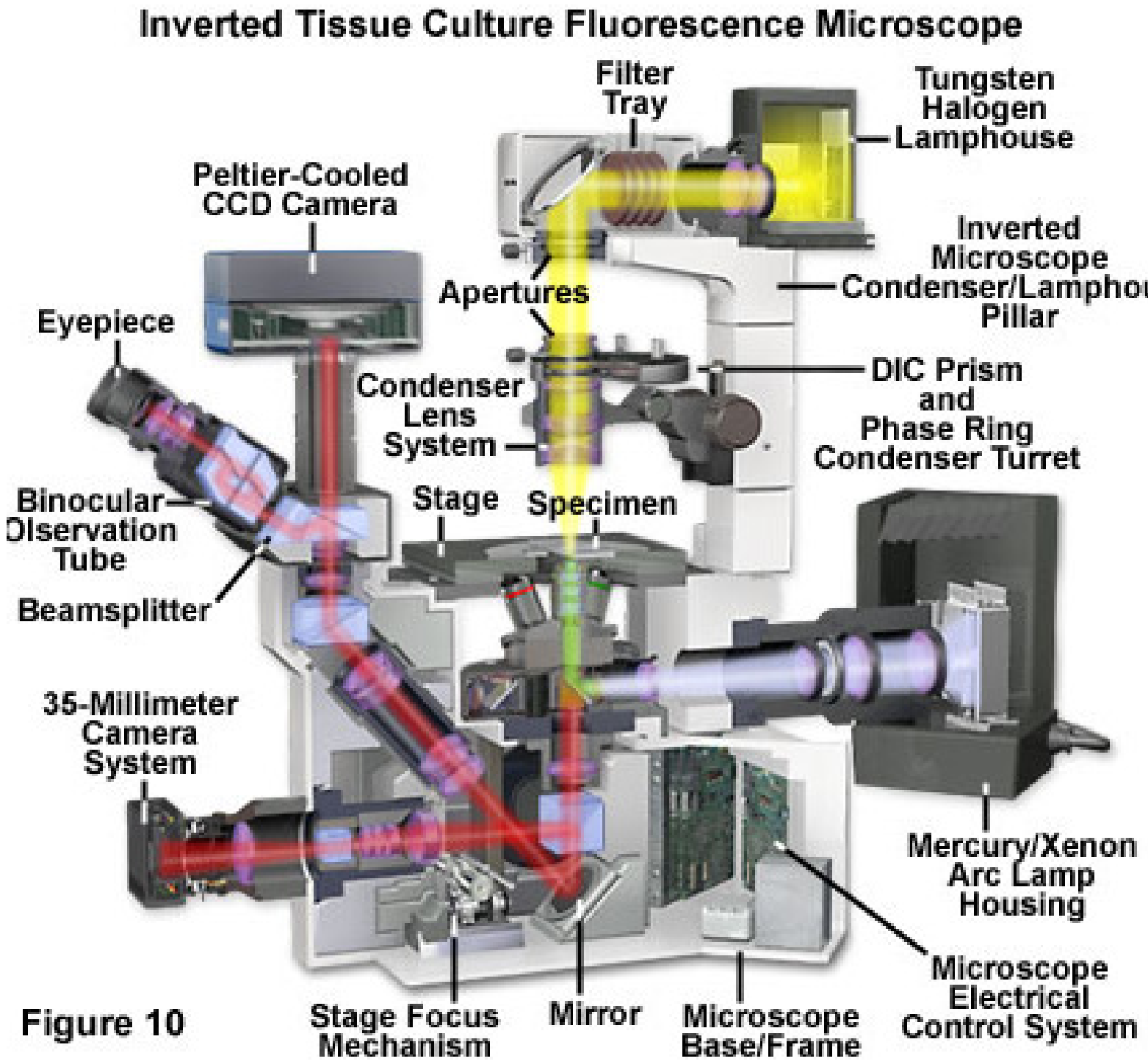
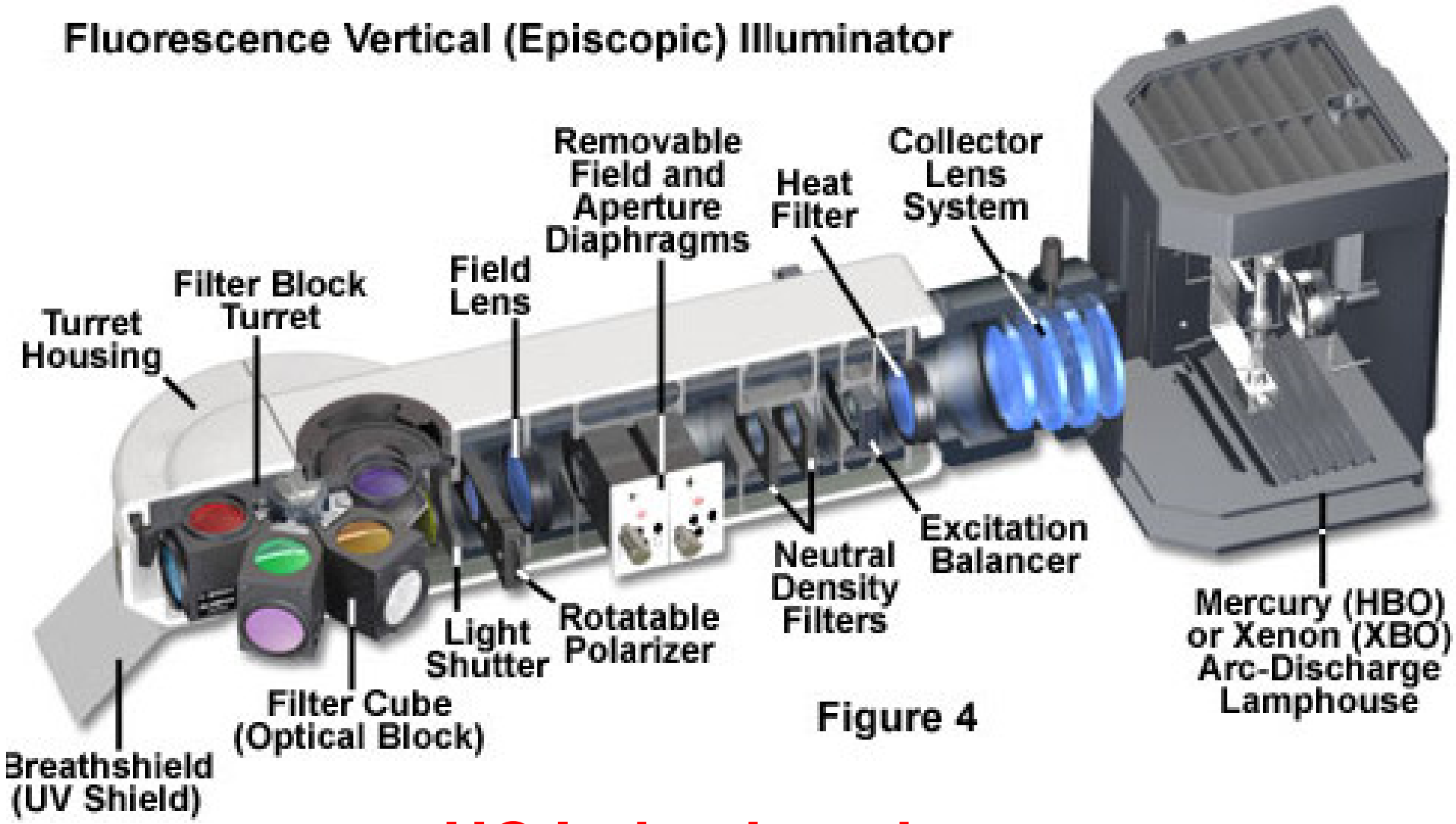

Inverted Tissue Culture Fluorescence Microscope
Filter Tray
Tungsten Halogen Lamphouse
Peltier-Cooled CCD Camera
Inverted Microscope
Condenser/Lamphouse Pillar
Apertures
Eyepiece
DIC Prism and Phase Ring Condenser Turret
Condenser Lens System
Binocular Observation Tube
Stage
Specimen
Beamsplitter
35-Millimeter Camera System
Mercury/Xenon Arc Lamp Housing
Microscope Electrical Control System
Stage Focus Mechanism
Mirror
Microscope Base/Frame

Figure 10



UC Irvine has the
Laboratory for Fluorescence Dynamics (LFD)
http://www.lfd.uci.edu/

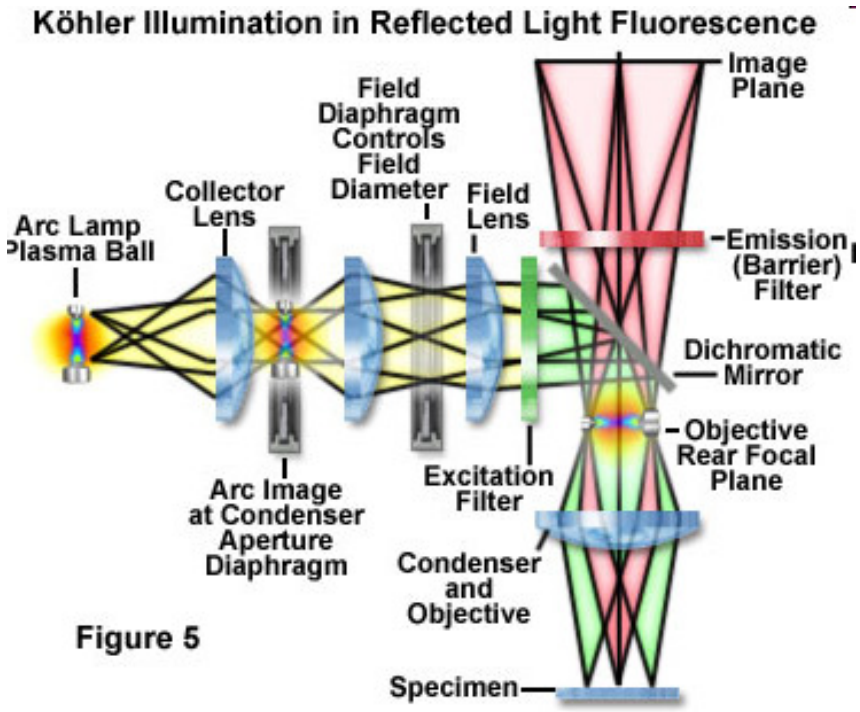


Figure 5

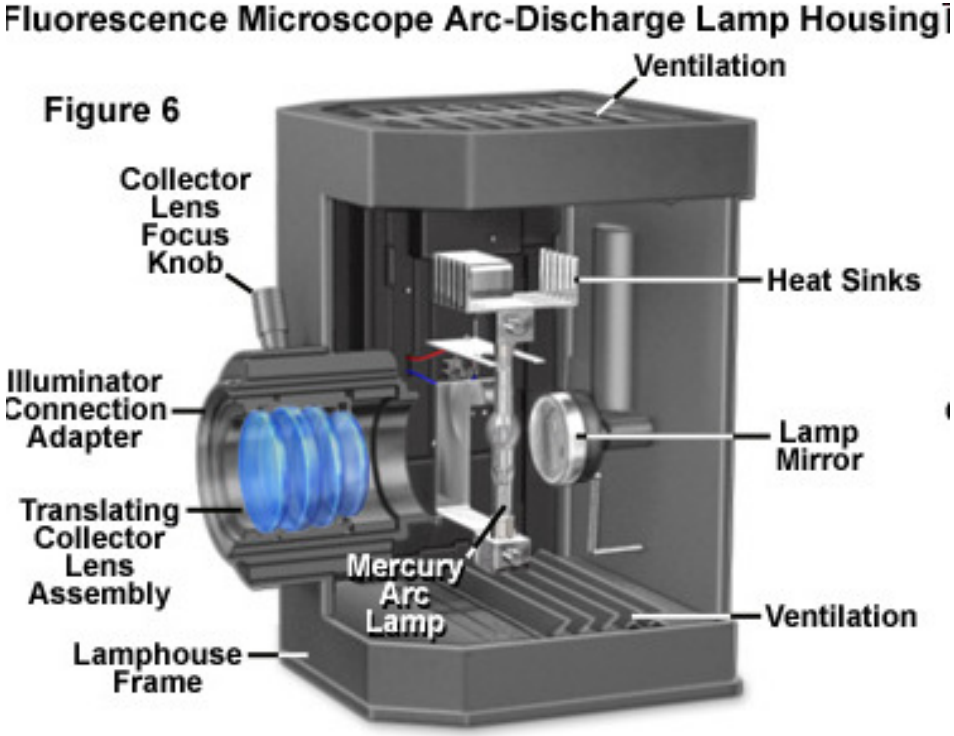


Figure 6

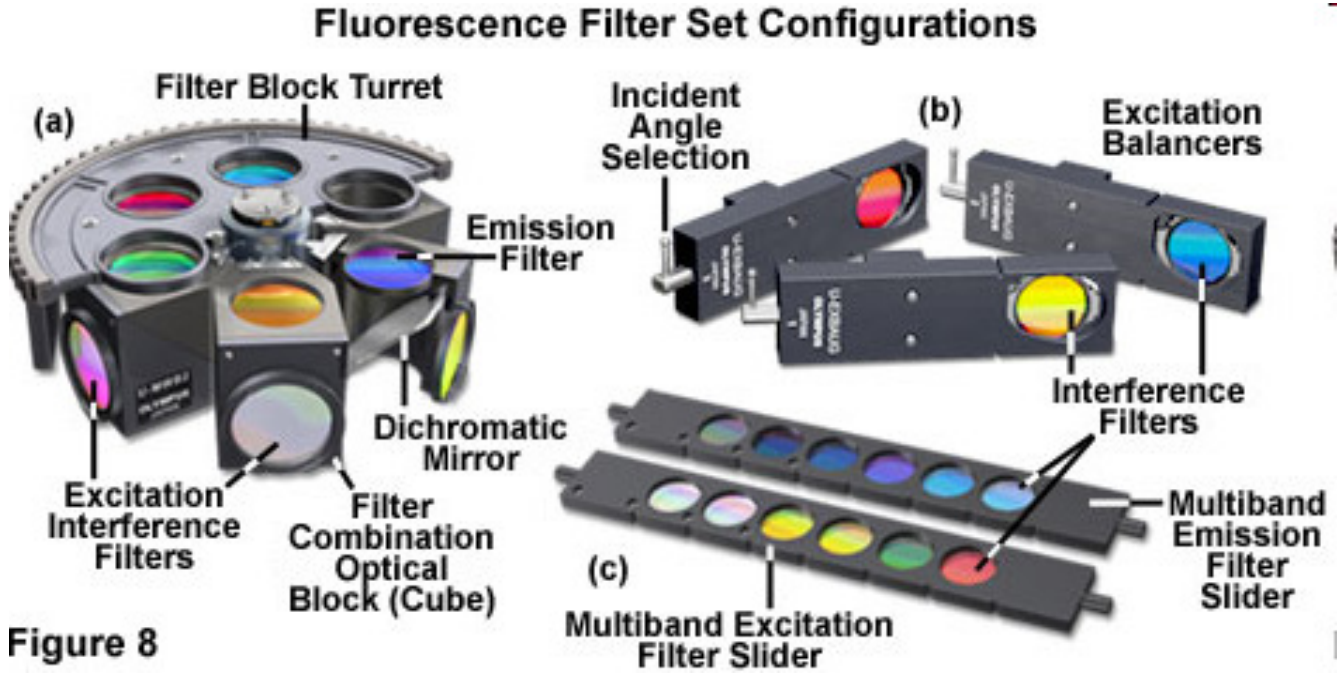
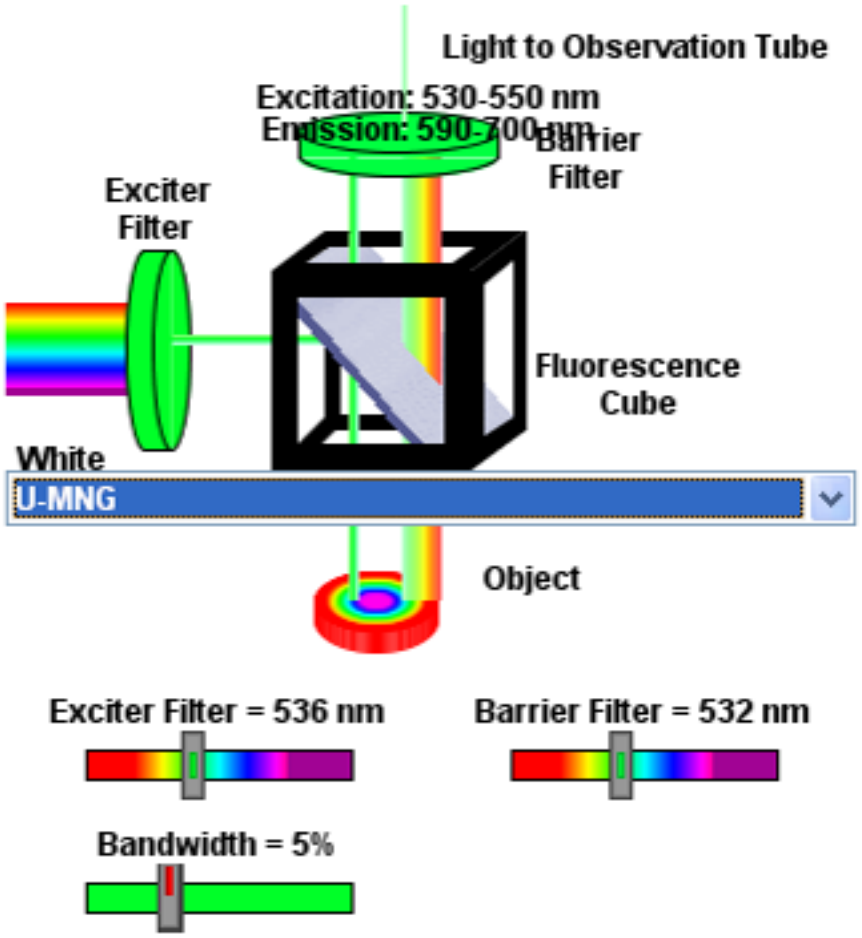


Figure 8

Interactive Java Tutorials

Excitation and Barrier Filters in Fluorescent Microscopy

The fluorescence tutorial explores how excitation and barrier filters can be interchanged to permit a wide spectrum of specific wavelengths to probe fluorescence samples. Detailed instructions on how to operate the tutorial are given below the applet window.



http://www.olympusmicro.com/primer/

Fluorescence Filter Cube (Block) and Associated Spectra

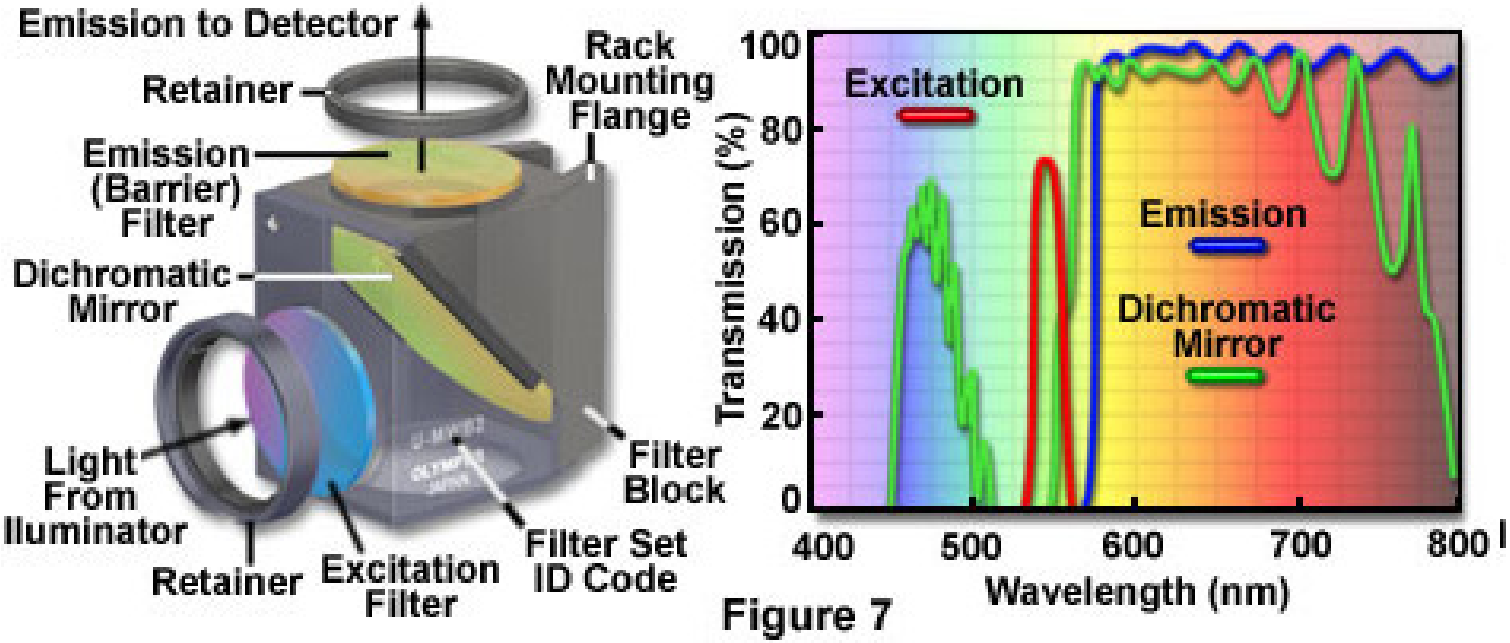


Figure 7

Circular and Rectangular Field Stop Comparison

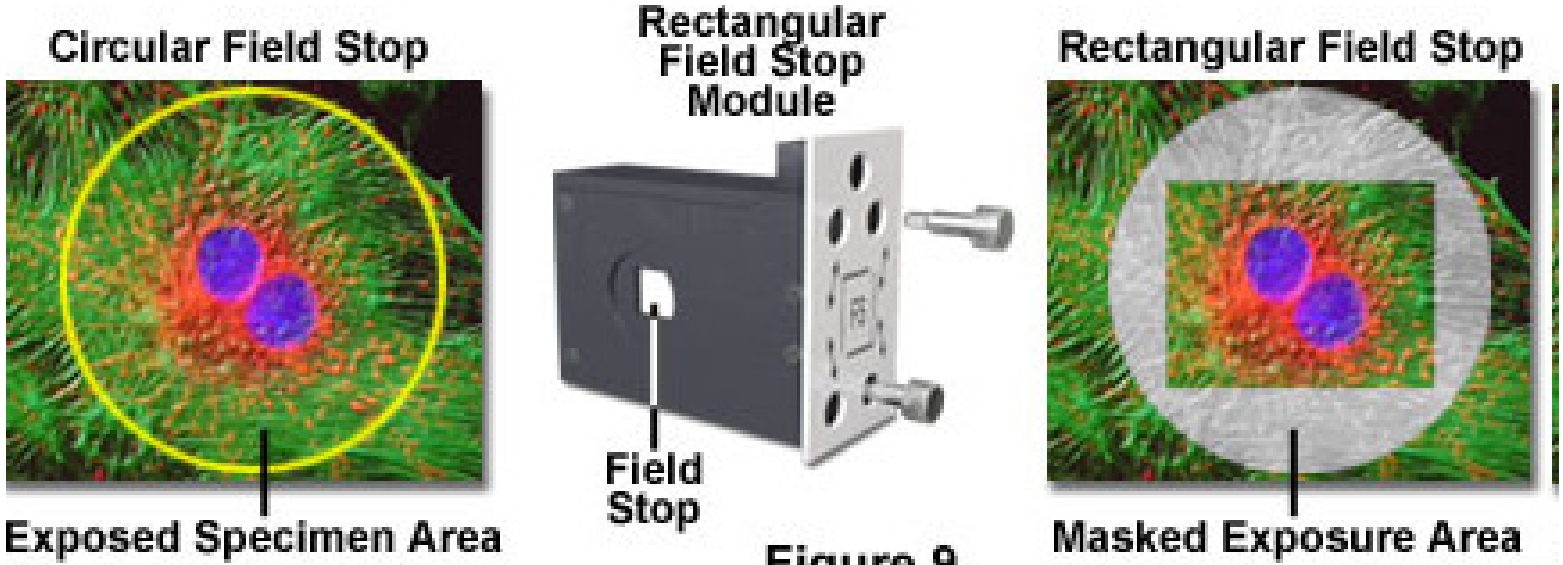
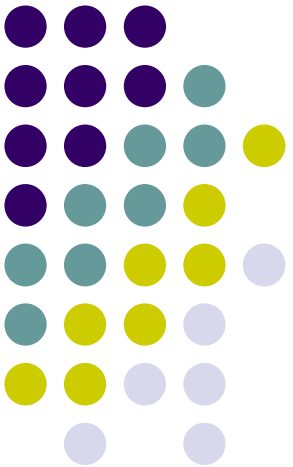


Figure 9

Part I – How Do We “See” the World Around Us?



EyeBall Optics

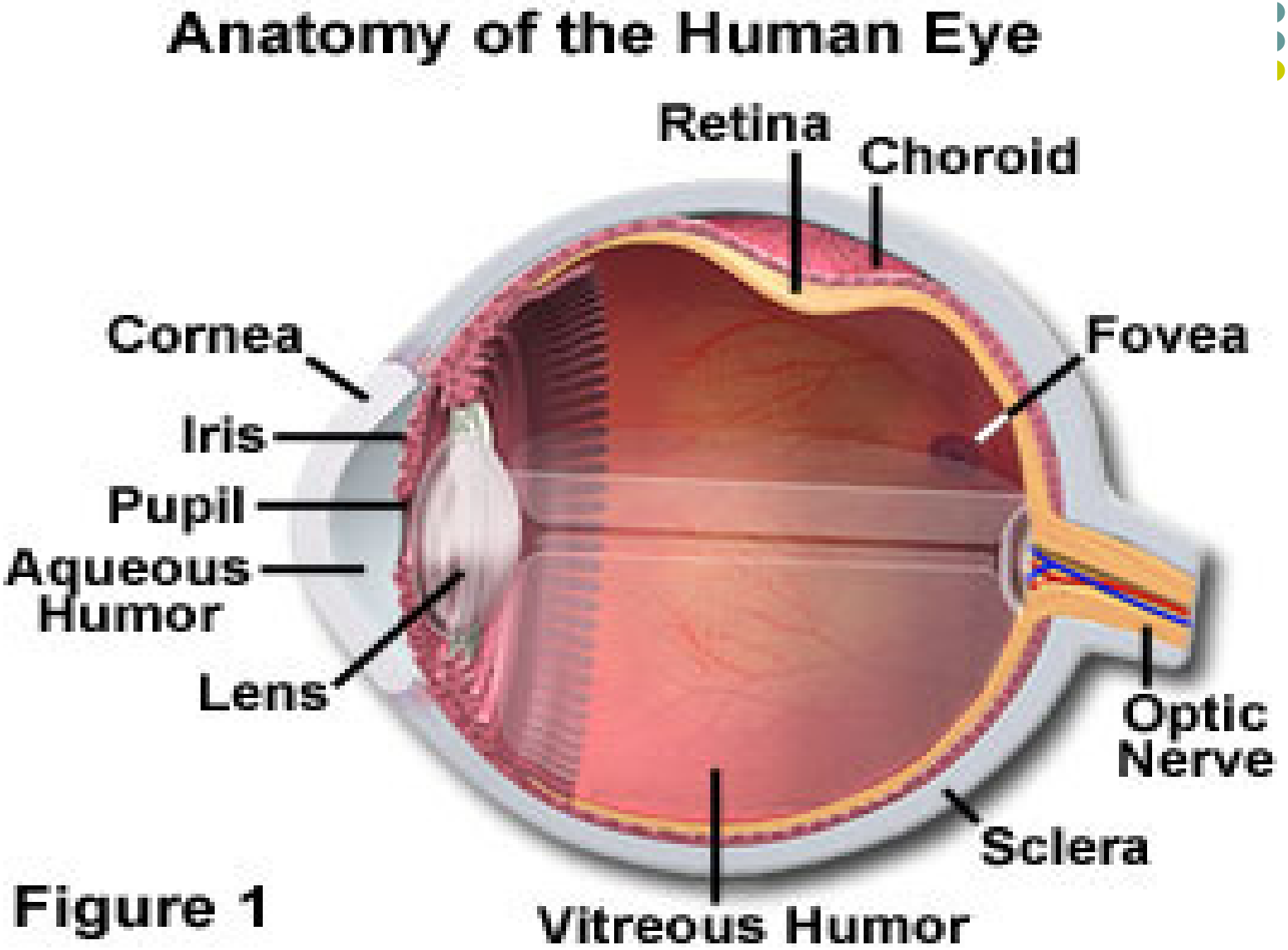
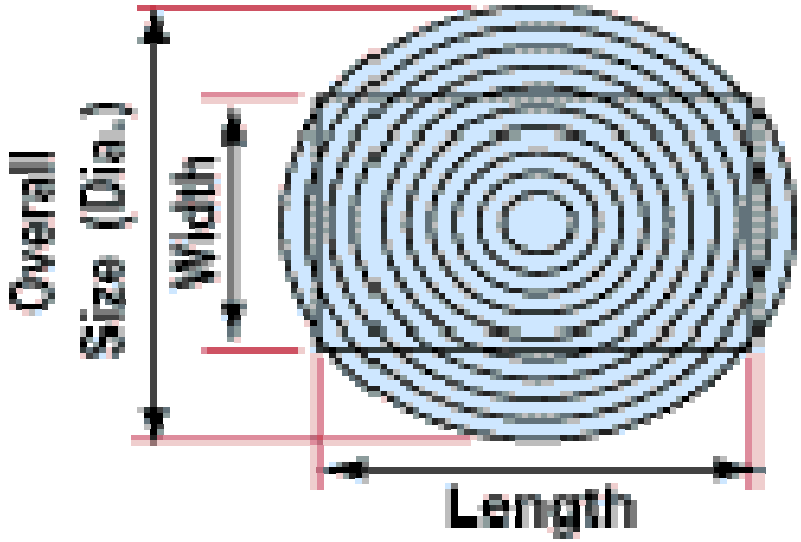
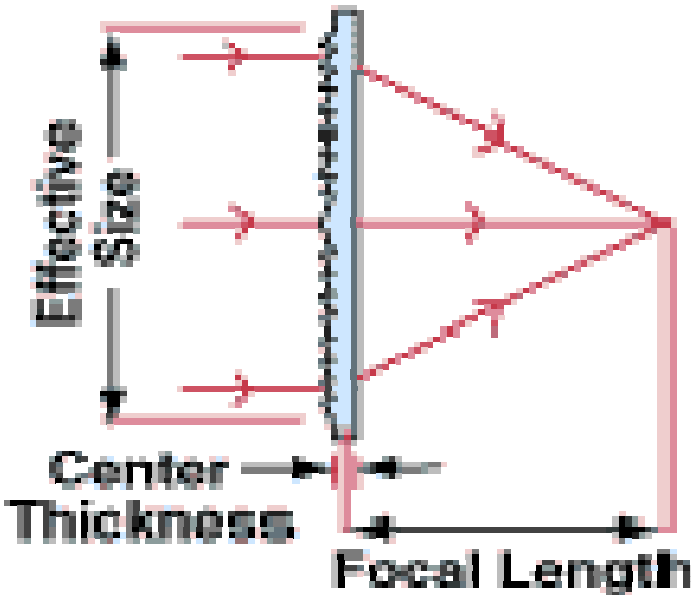


Figure 1

What's a Fresnel Lens Anyway?

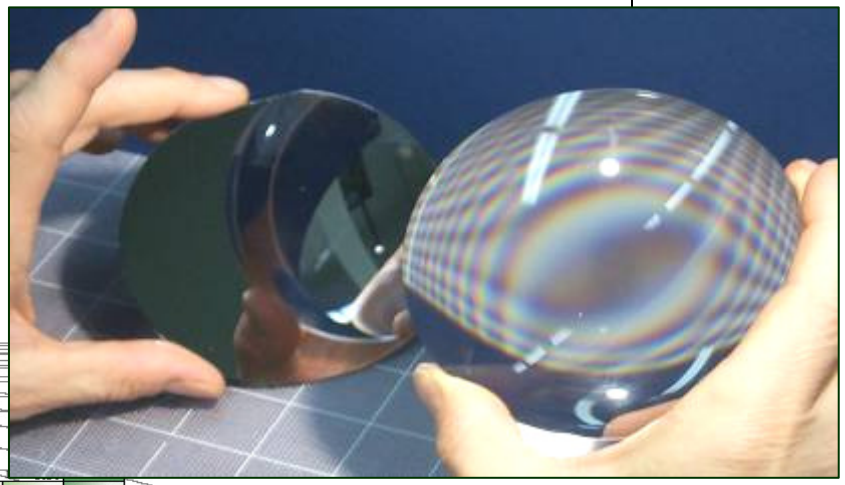


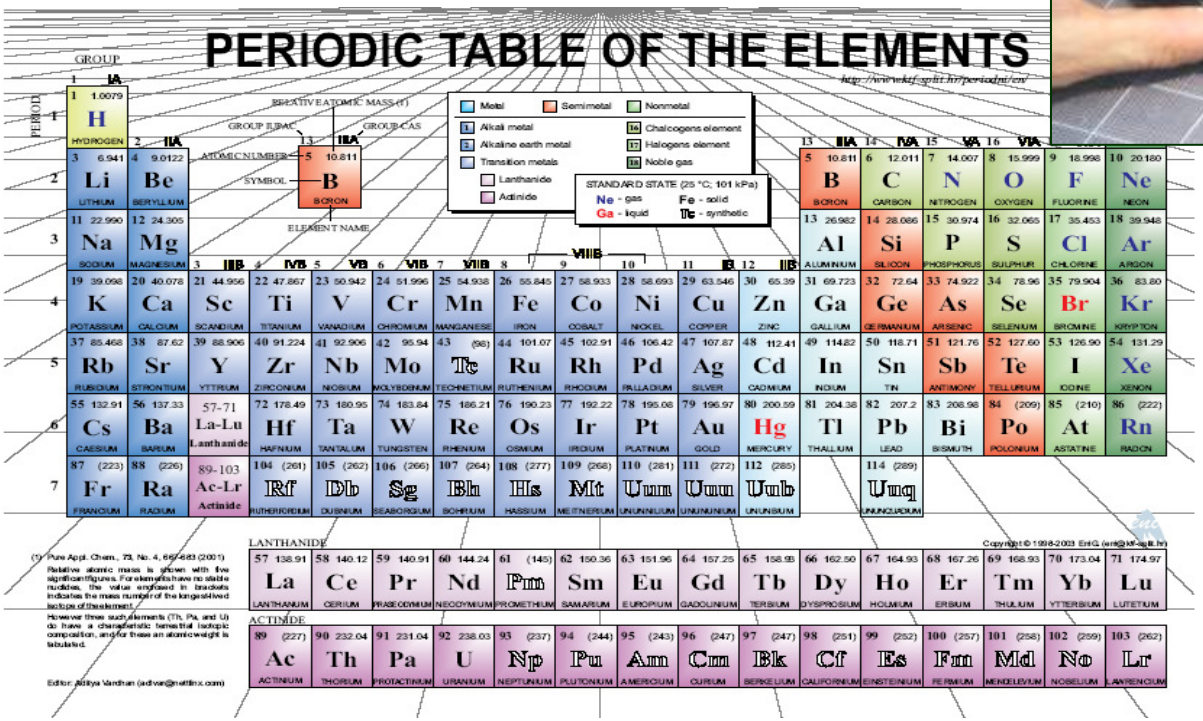


Aberration Examples with overhead projector.

Optical Engineers Work with Materials That Reflect or Transmit Light

Si – polished silicon wafer mirror-like reflector



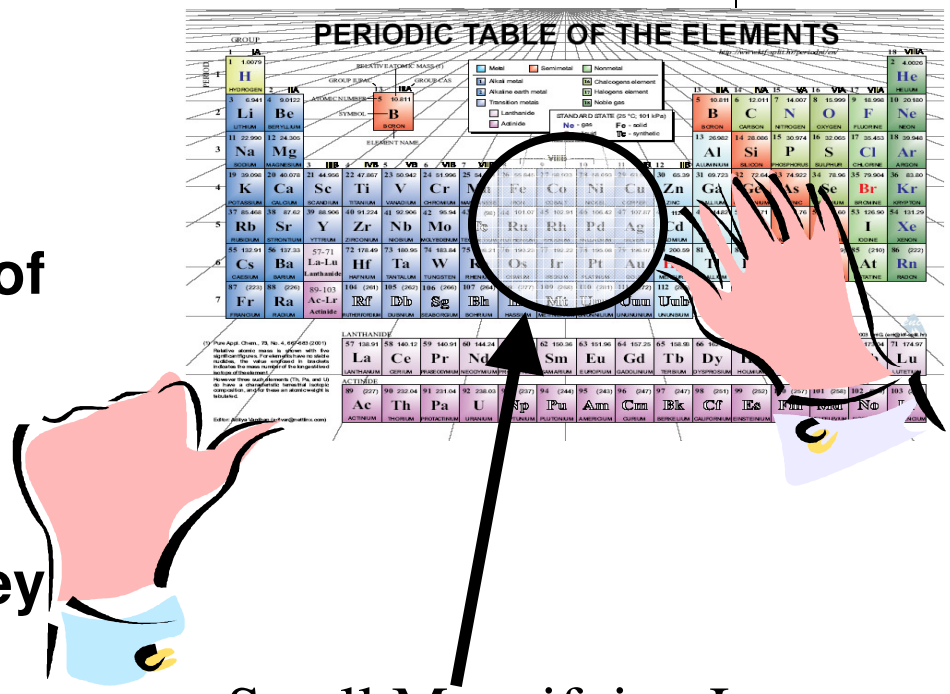


SiO_2 – clear silica lens focuses light

Magic Dots

Most printed material is made up of lots of Dots!!

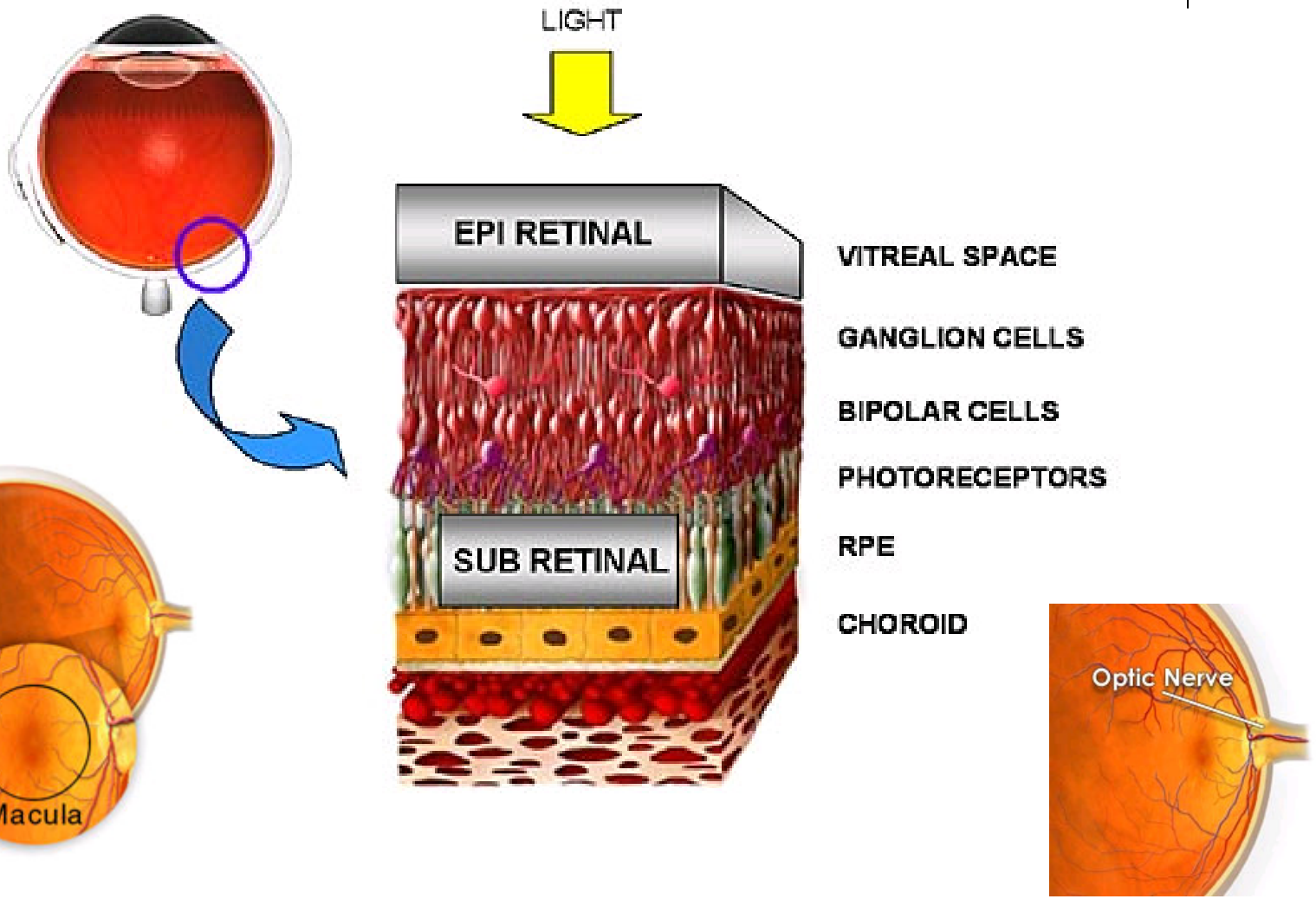
- **Have you ever wondered how printing works?**
- **Most modern printers use lots of dots to make up the text & images that you see.**
- **Do you know what color ink they use?**
- **Use the small magnifying lens to look at the Periodic Table. Do you see the Magic Dots??**



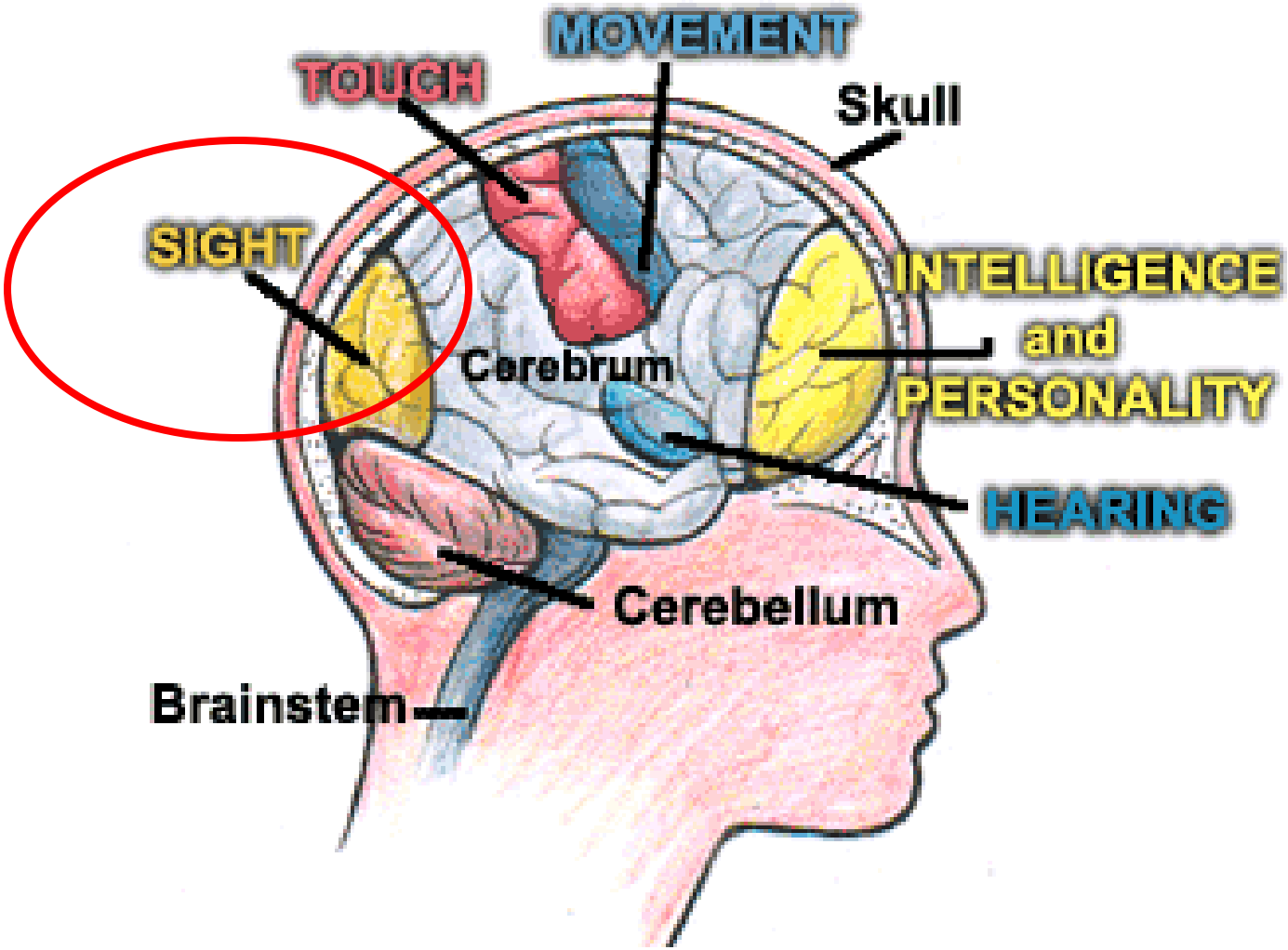
Small Magnifying Lens

Hold the lens about 1 inch above the paper.

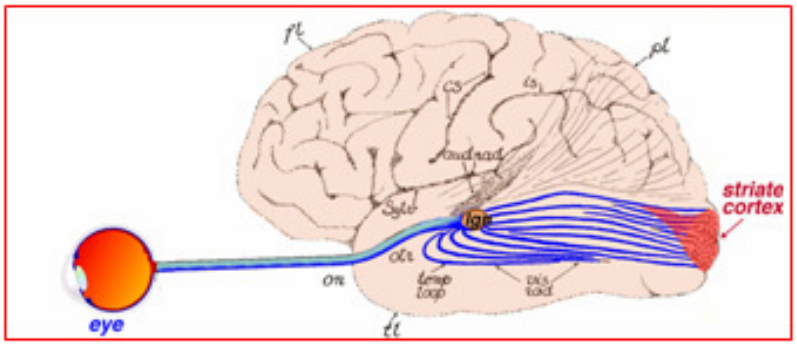
The Retina as a Detector

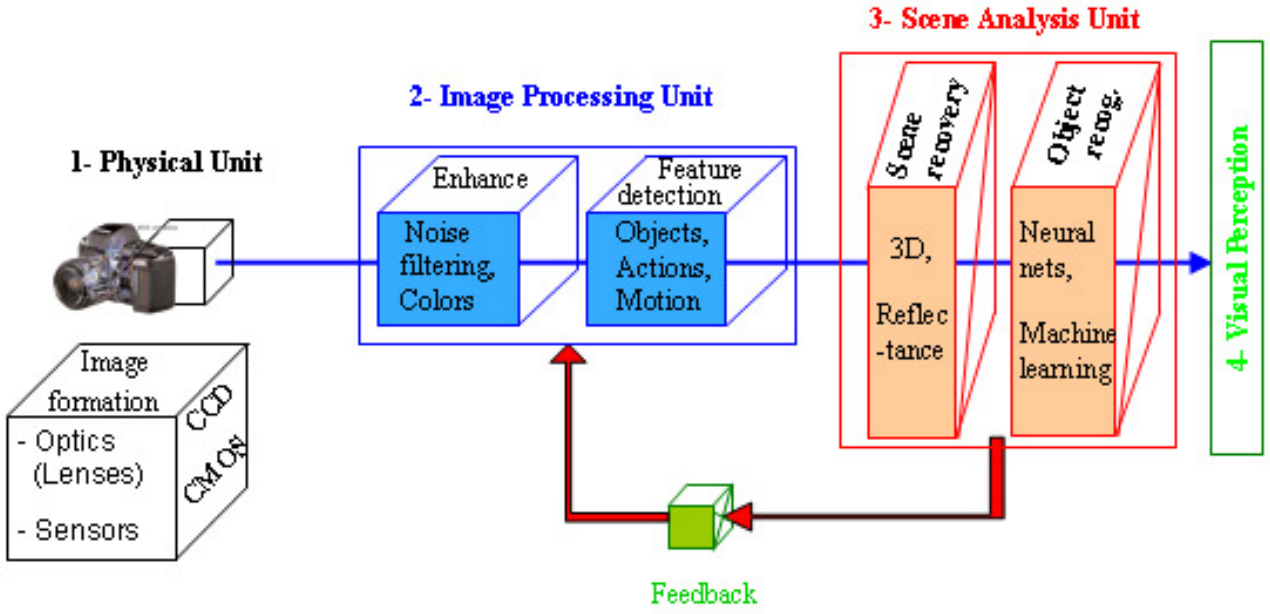


The Brain as a Computer

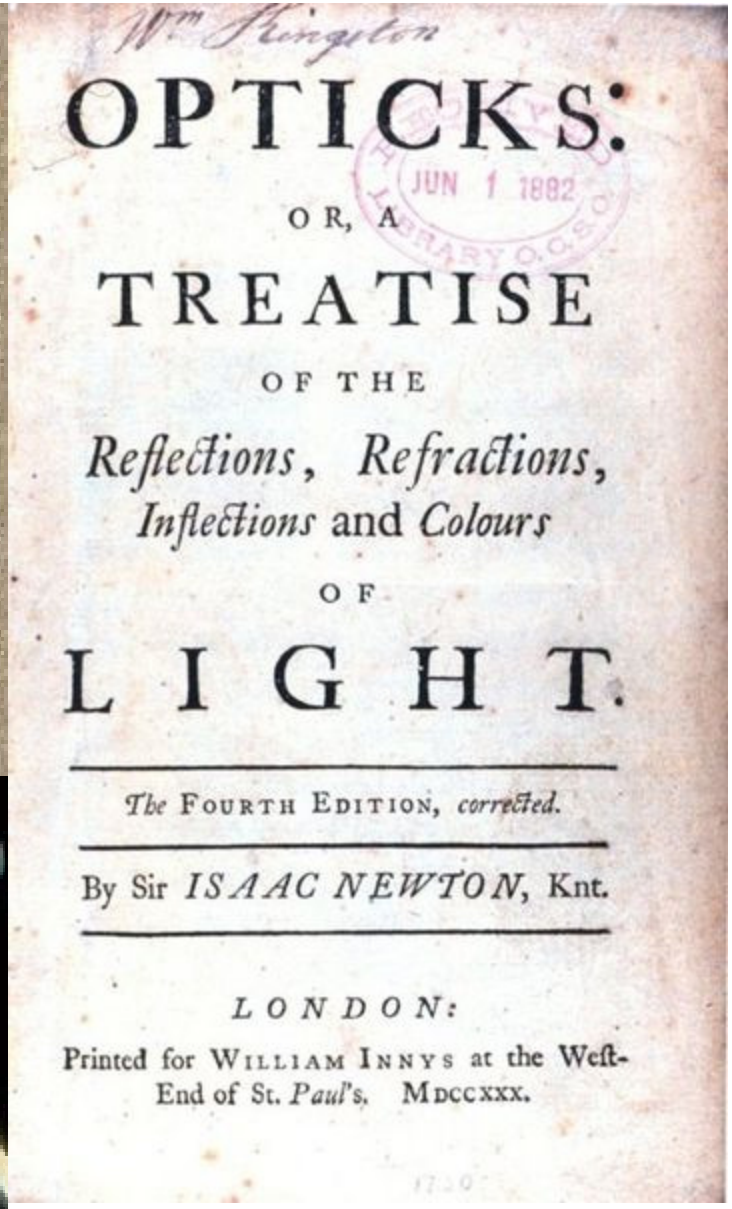


Part II – How Do We "Interpret" the World we "See" Around Us?





Stages of Computer Vision, Copyright ©2005 F. Keymoux



Wm Pickering

OPTICKS:

OR, A

TREATISE

OF THE

Reflections, Refractions, Inflections and *Colours*

OF

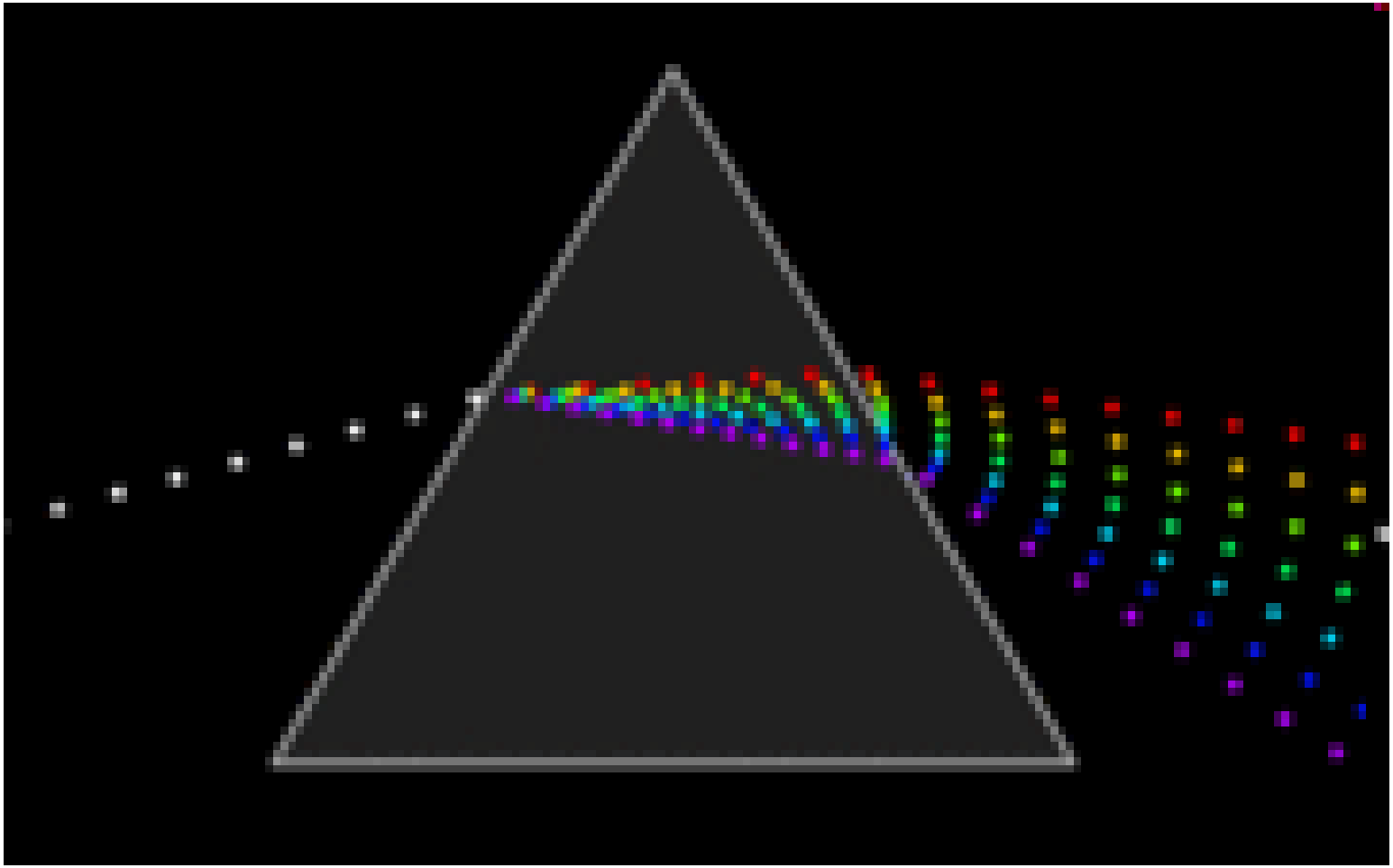
L I G H T.

The Fourth Edition, *corrected.*

By Sir *ISAAC NEWTON*, Knt.

LONDON:

Printed for William Innys at the West-End of St. *Paul's*. Mdccxxx.



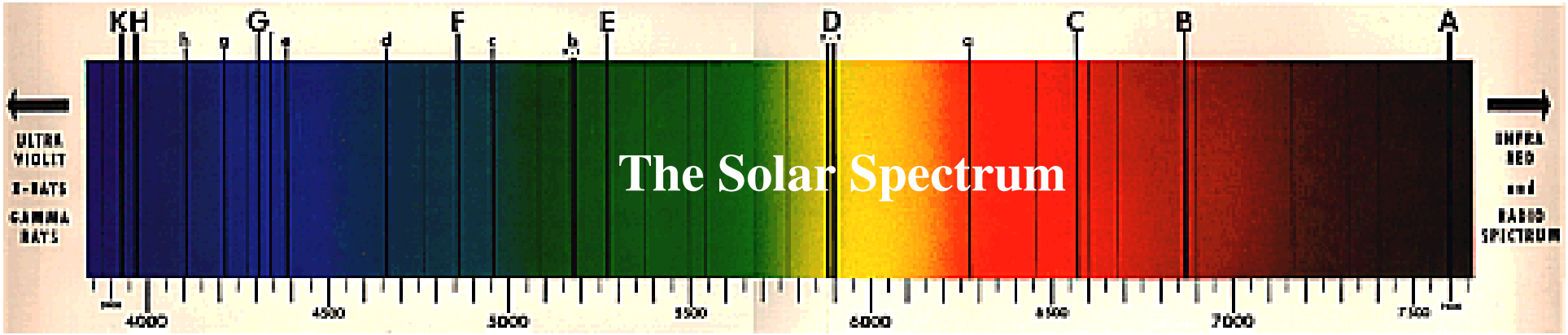
http://en.wikipedia.org/wiki/Image:Light_dispersion_conceptual.gif

Rainbow Peephole®

Diffraction Gratings

- Light is “redirected” in passing through the plastic peephole to the eye.
- Where do the colors come from?
- Do you see a regular pattern?
- Identify the colors. Are they the same in each spot?
- Does the pattern change if the light is close or far from the peephole? How?
- Do you see colors from the room lights?
- The regular array of bumps on the plastic peephole's surface allows us to see the color in white light through “diffraction.”

We can know what is in the light source by understanding the spectrum.



UV
X-Ray
Cosmic

Visible

IR
Radio

What is Light??

Light is Like a Vibrating Wave

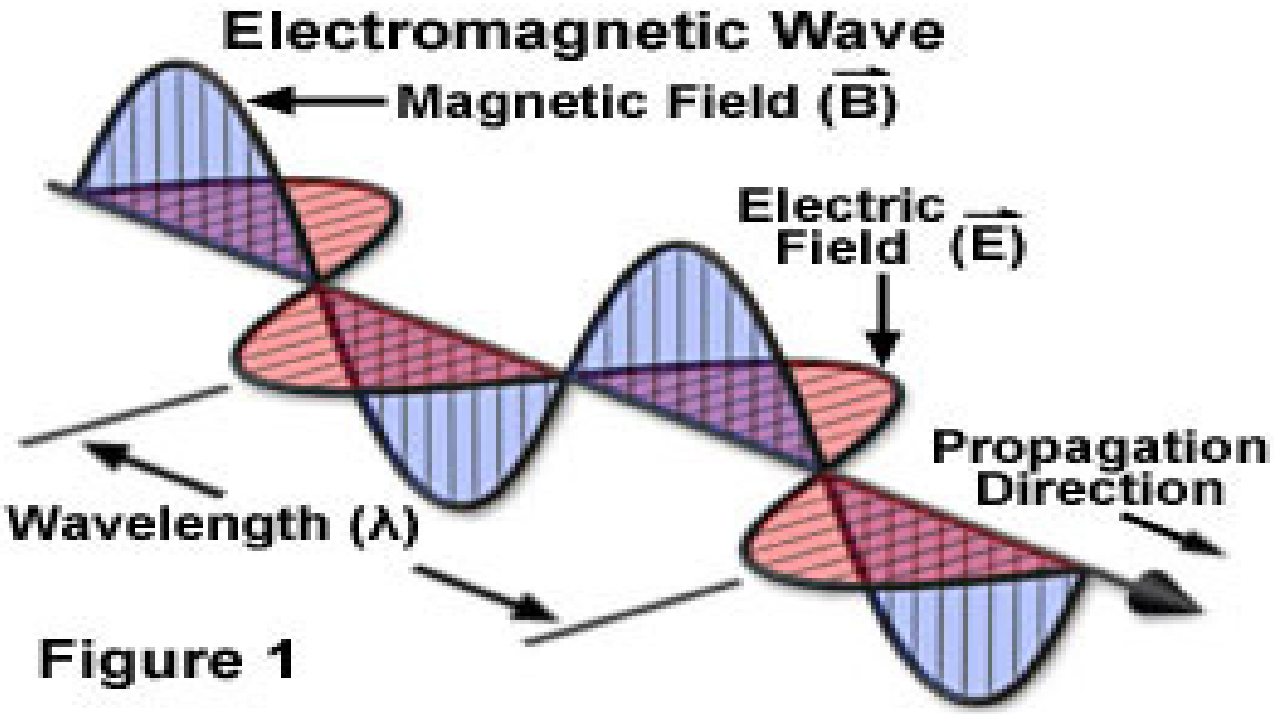
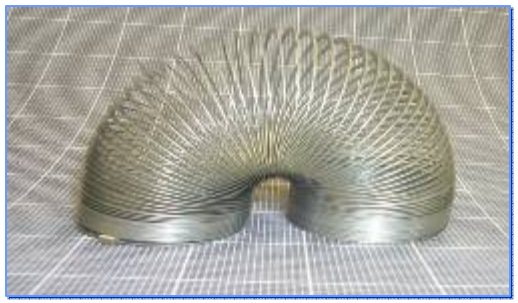
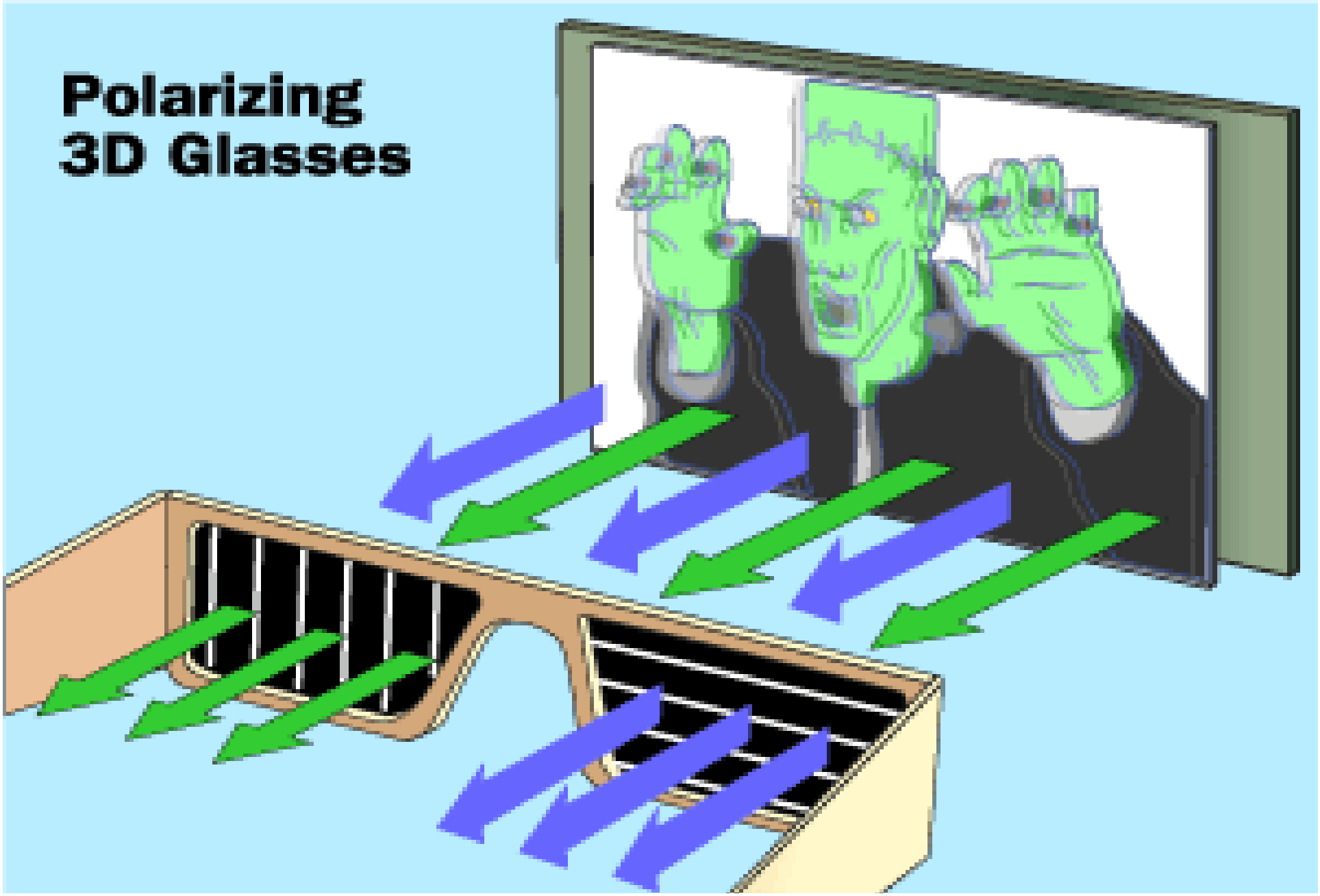


Figure 1



Slinky

- Light is like pure energy with no rest mass (because it is never at rest!!)



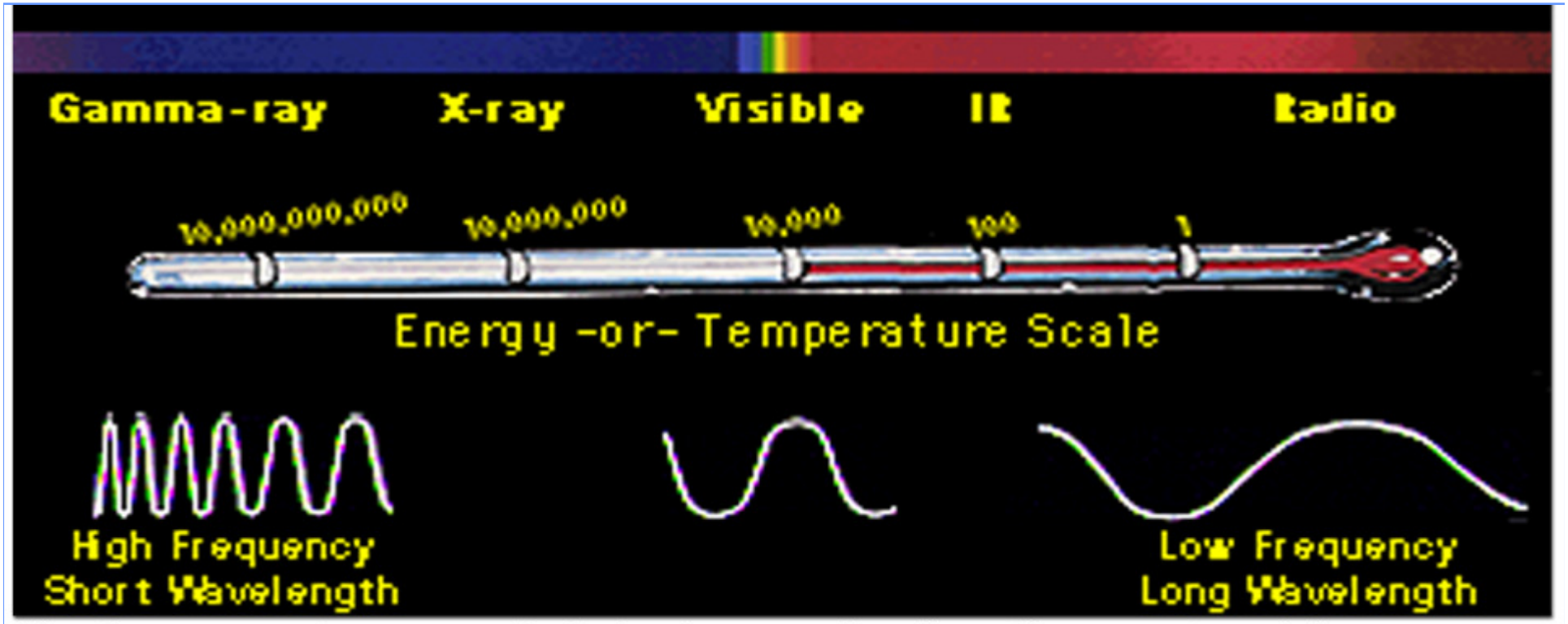
The polarized glasses allow only one of the images into each eye because each lens has a different polarization. Image courtesy of howstuffworks.com

Magic Stripes

Polarization of Light

- Where do the colors come from?
- Make your own polariscope and find the stripes in the plastic and glass materials.
- Geologists, identify minerals with polarized light microscopes.
- Civil engineers examine stresses inside structures with transparent models and a polariscope.

LIGHT - Electromagnetic Spectrum



The electromagnetic spectrum. Radio has long wavelengths and low energies, while gamma rays have very short wavelengths and high energies.

Magic Patch (temperature data vs. color)

- Place the patch on your wrist and perform the “vampire test.”
- The “*Magic Patch*” changes color with the heat from your body. The “living dead” give off no heat!
- Where do the colors come from?
- Does anyone see a vein or artery?
- This is an example of “selective reflection” by liquid crystals, painted onto the black paper.
- Liquid crystal are “ordered,” just like the students across the page.
- Scientists use liquid crystals to build displays for watches and computer games.



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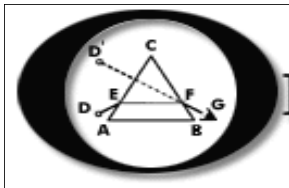
- The OISC & Beall Center are non-profit organizations and receive grant funding and donations from people like you to bring these programs to the public.
- Please teach your children personal financial responsibility.
- We would like to thank our sponsors and partners on the following slide.
- Enjoy the rest of your Family Day Event



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Of Southern California

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