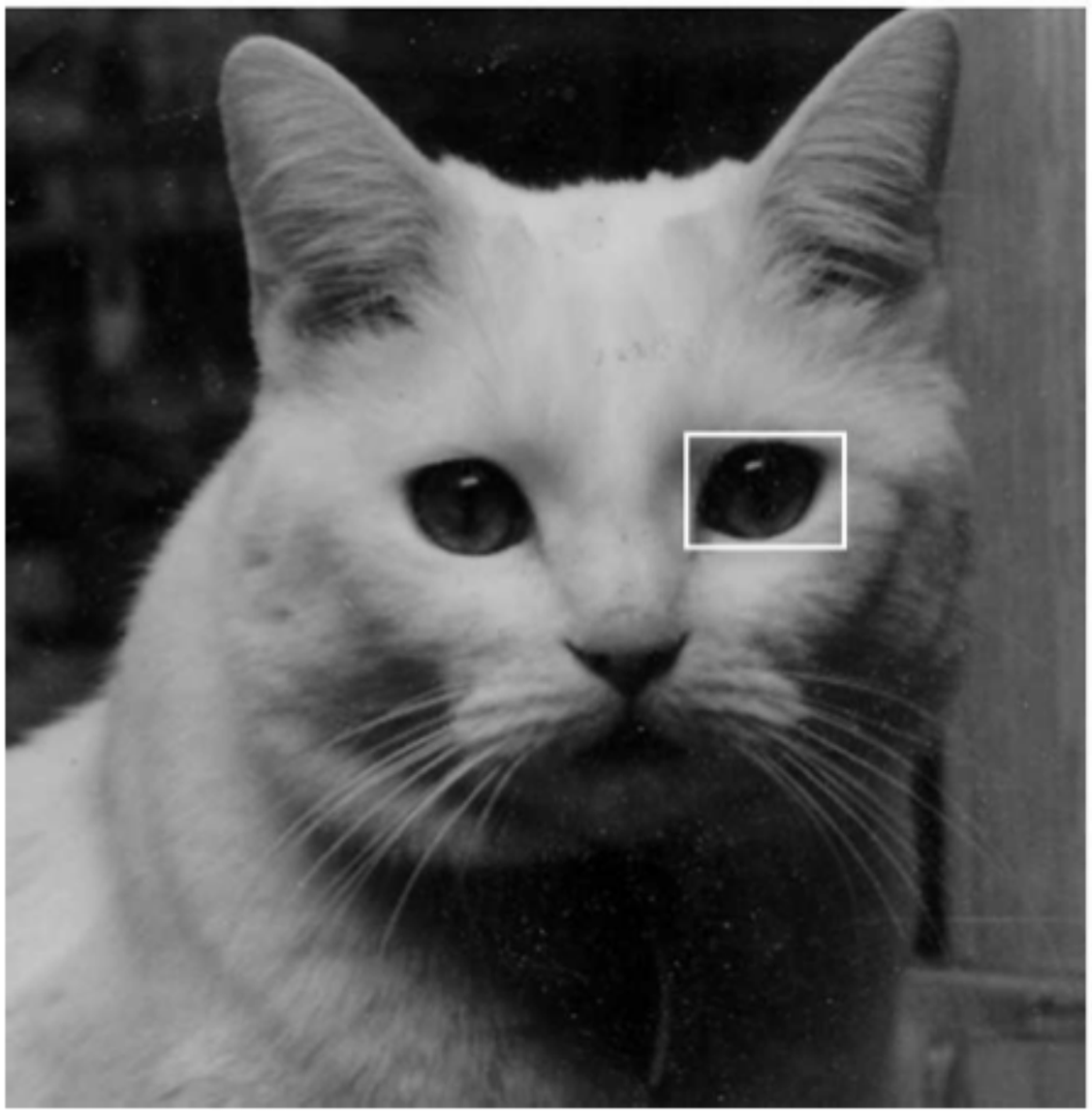
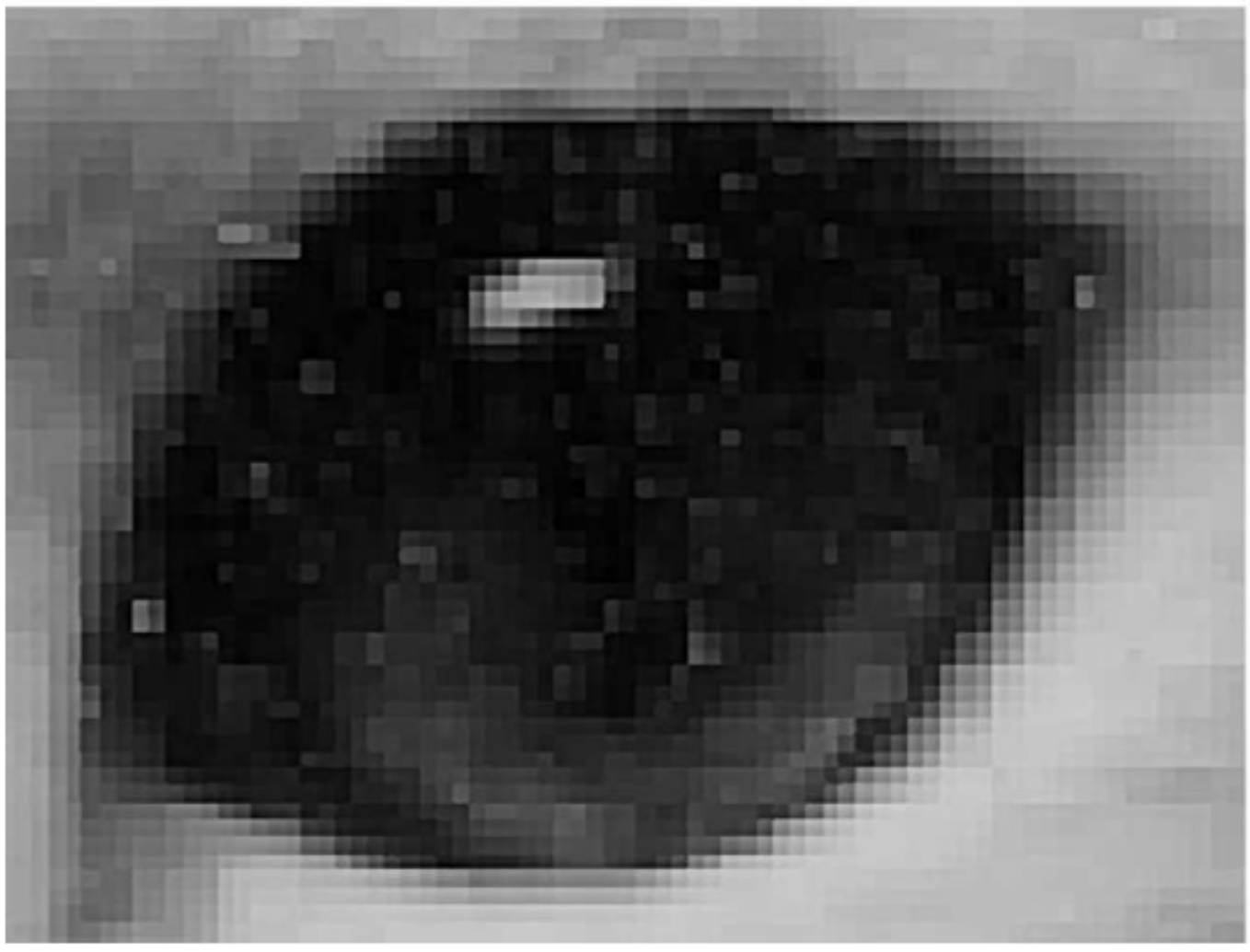
Raster Devices and Images

Raster Image





A **raster image** is 2D array storing pixel values at each pixel

virtually all graphics system are **raster based**

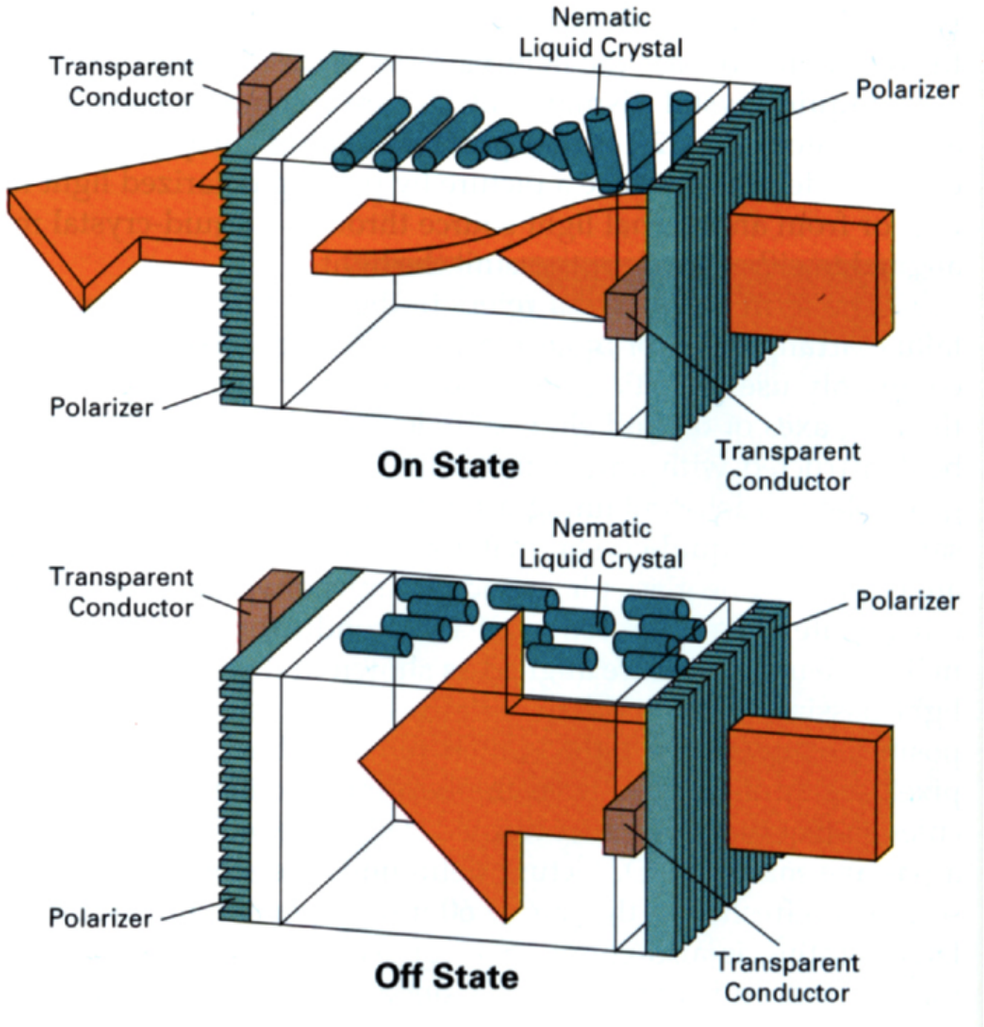
scanner
linear array of pixels swept across page to create grid of pixels

printer
image is made by depositing ink at points on a grid

display
shows images as a rectangular array of pixels

digital camera
image sensors made of grid of light-sensitive pixels

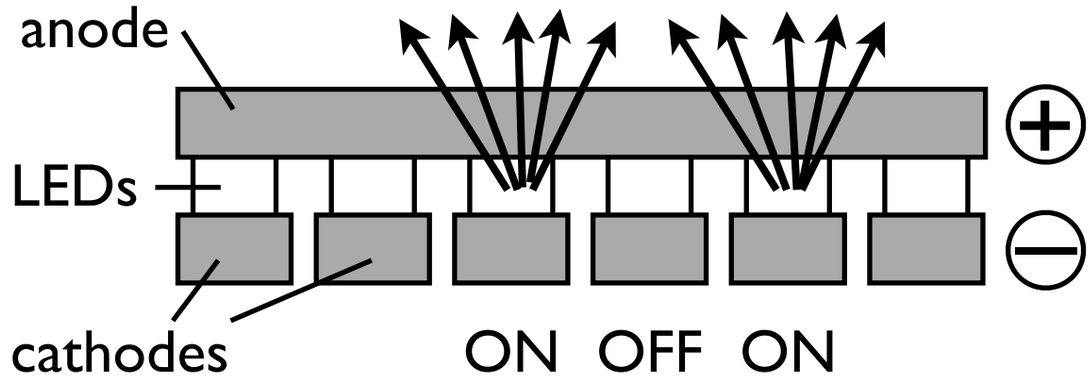
Displays are either **transmissive** or **emissive**



[H&B, Fig. 2-16]

one pixel of an **LCD** display

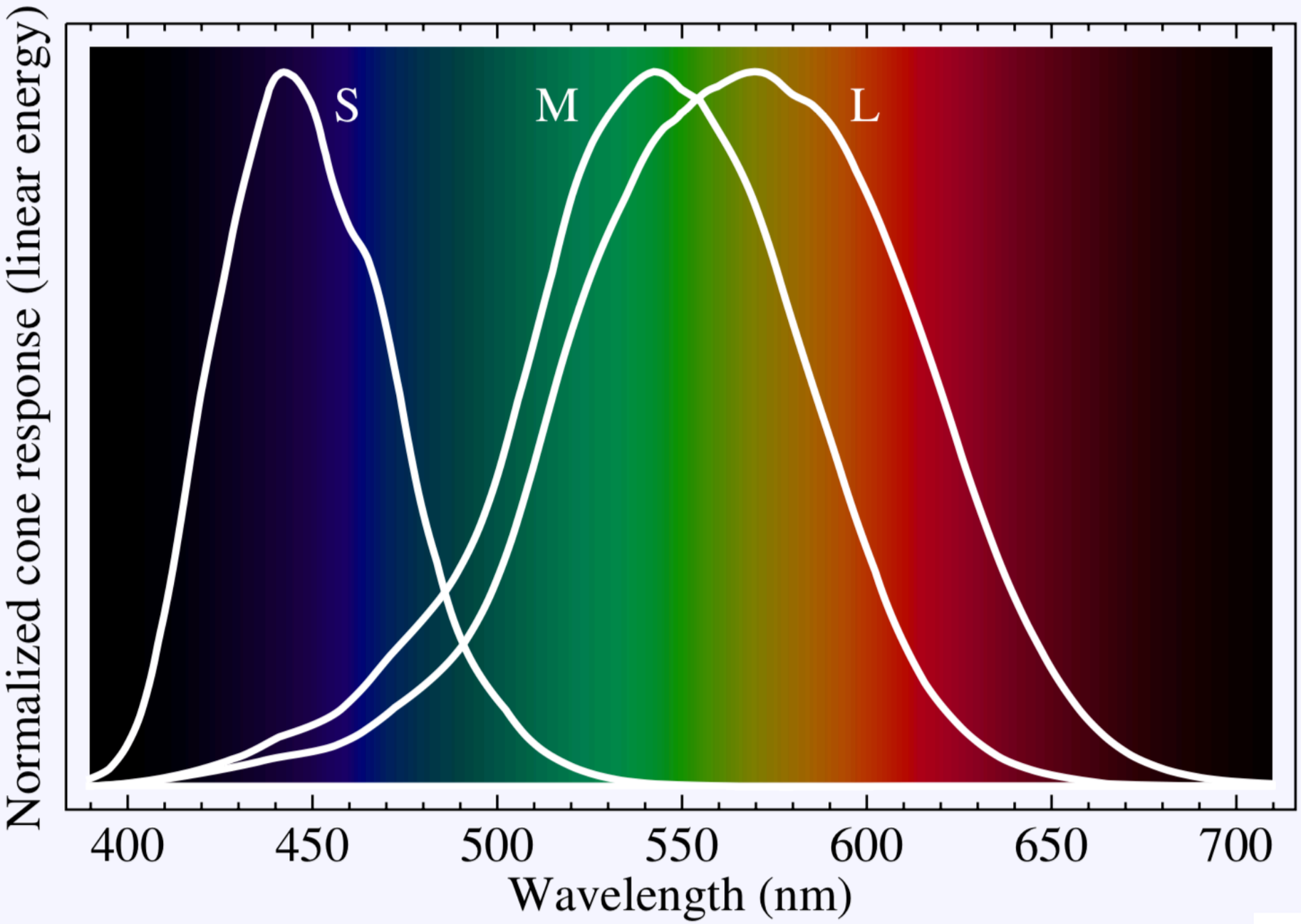
on state liquid crystal rotates the polarization of the light so it can pass through the front polarizer
off state front polarizer blocks light that passes the back polarizer



LED display

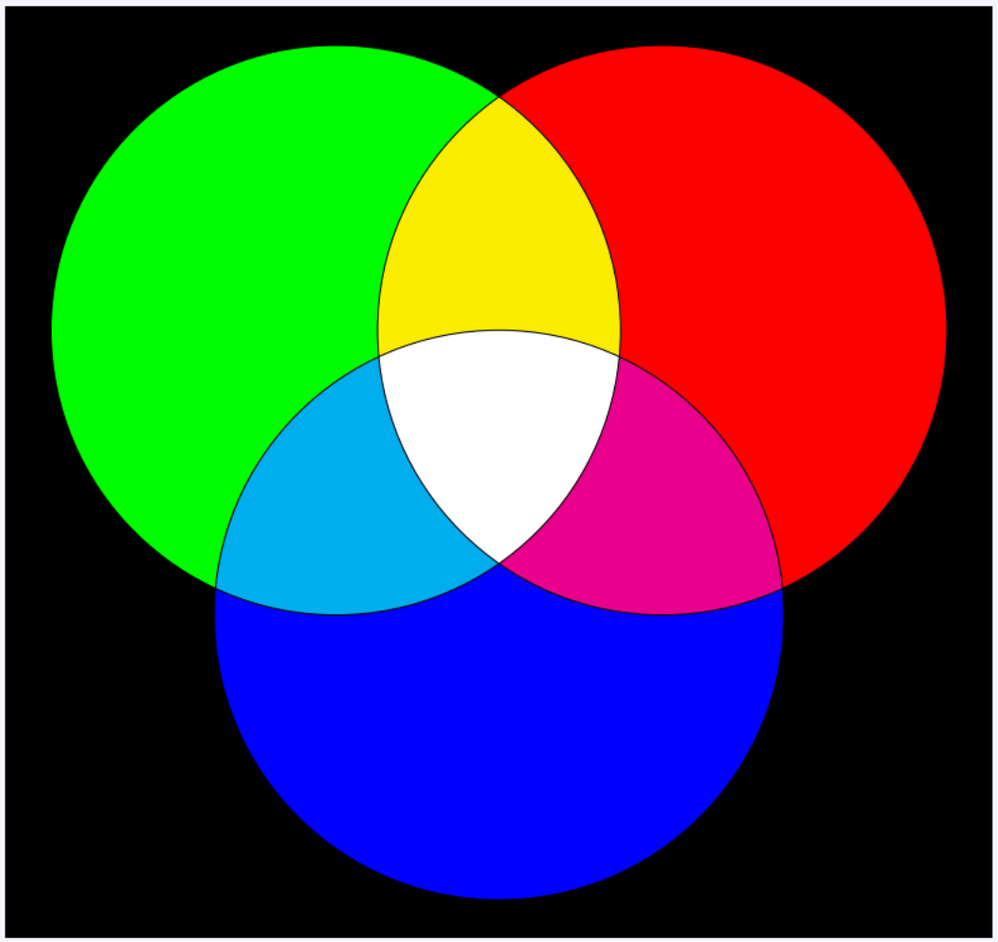
each pixel is composed of one or more **LEDs**, semiconductor devices that emit light with intensity dependent on current

Human color vision (Trichromacy)

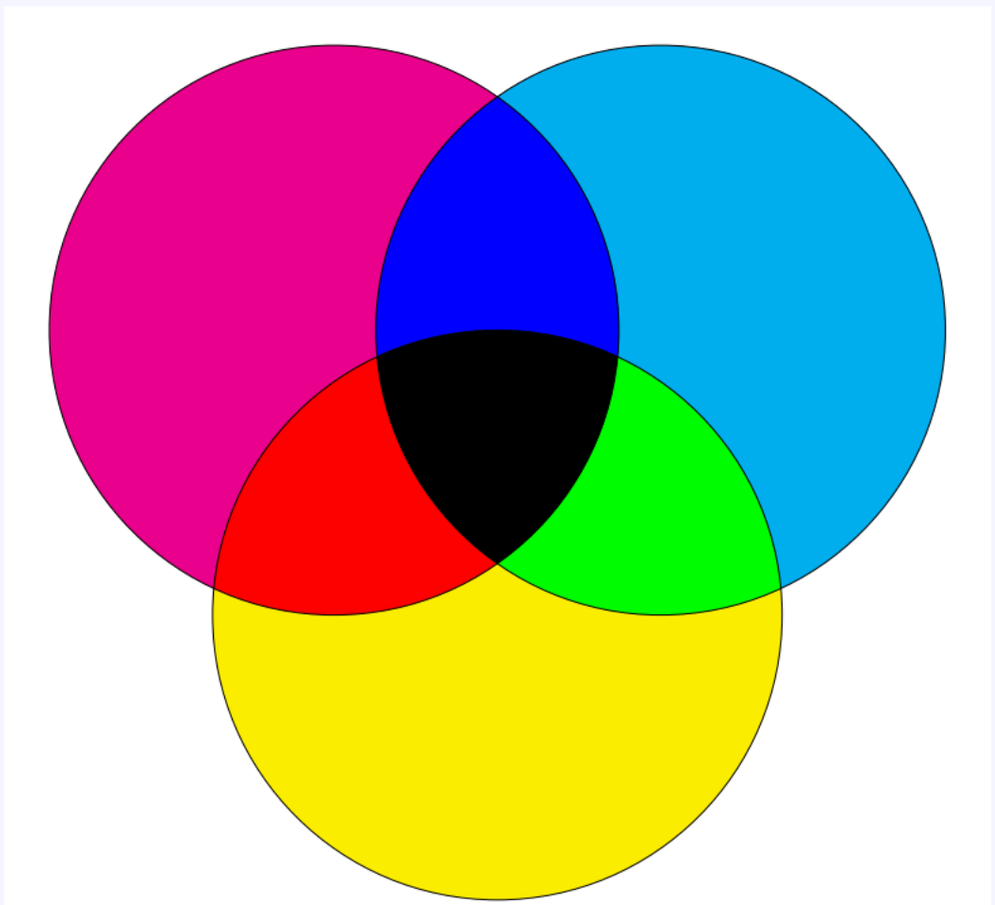


[Wikimedia]

Color Representation

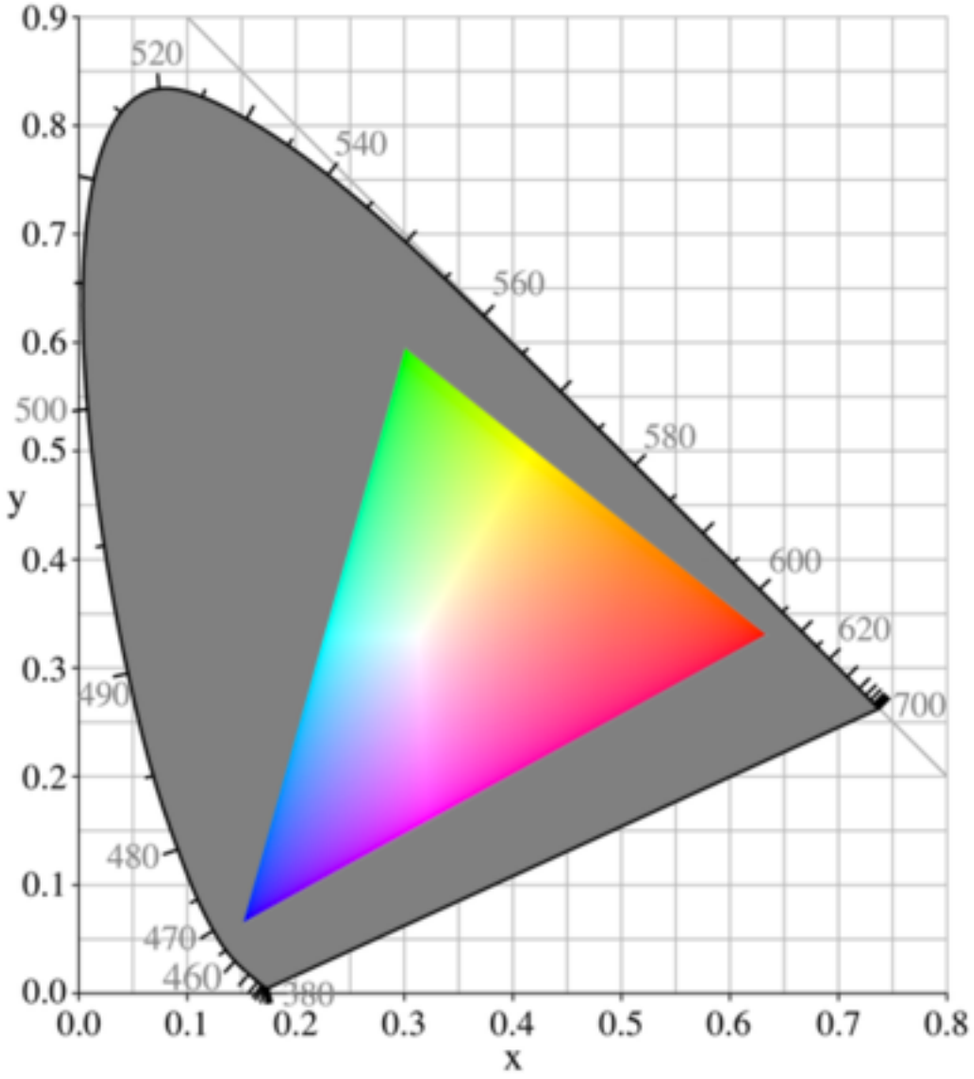


Additive
RGB

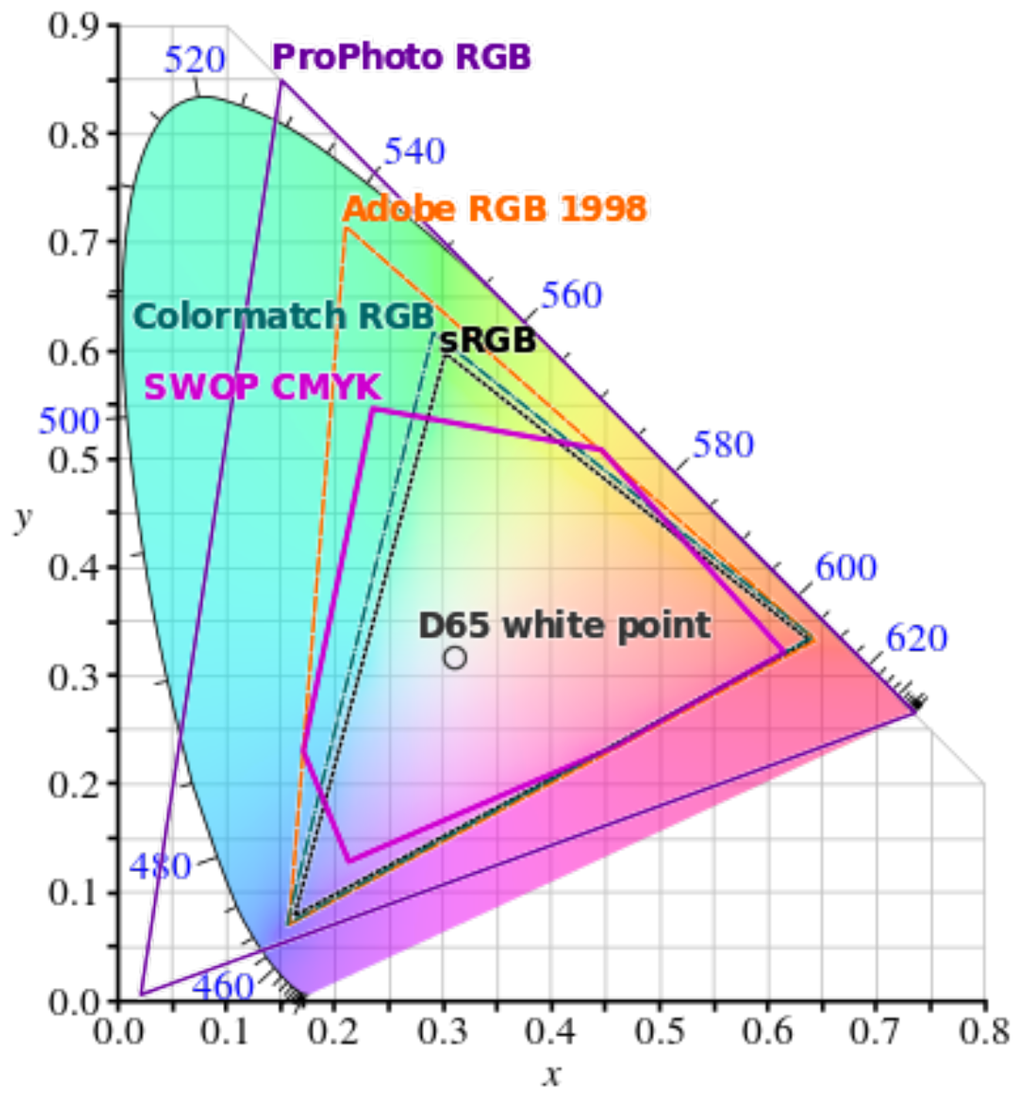


Subtractive
CYMK

Human color vision vs. RGB



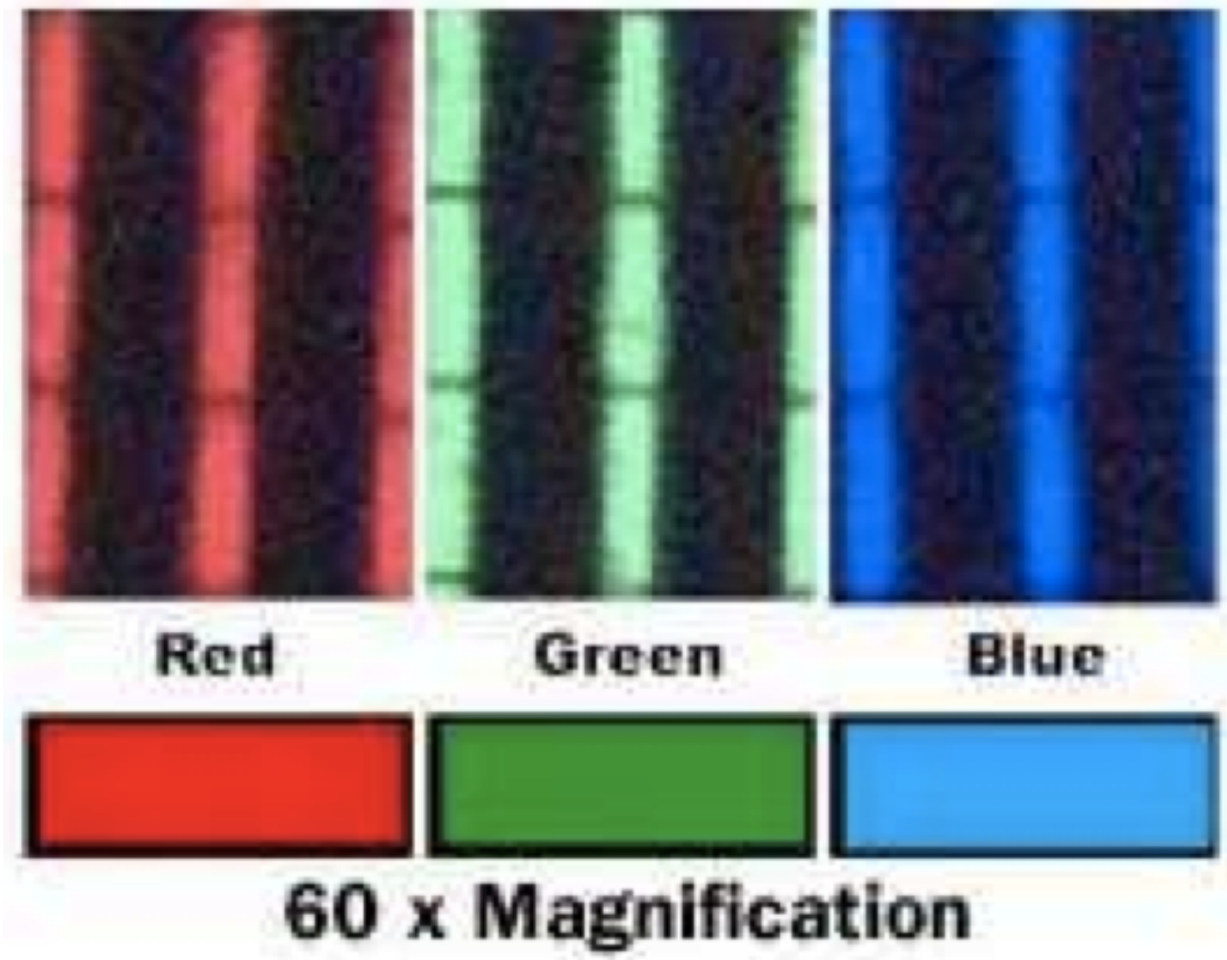
sRGB color triangle

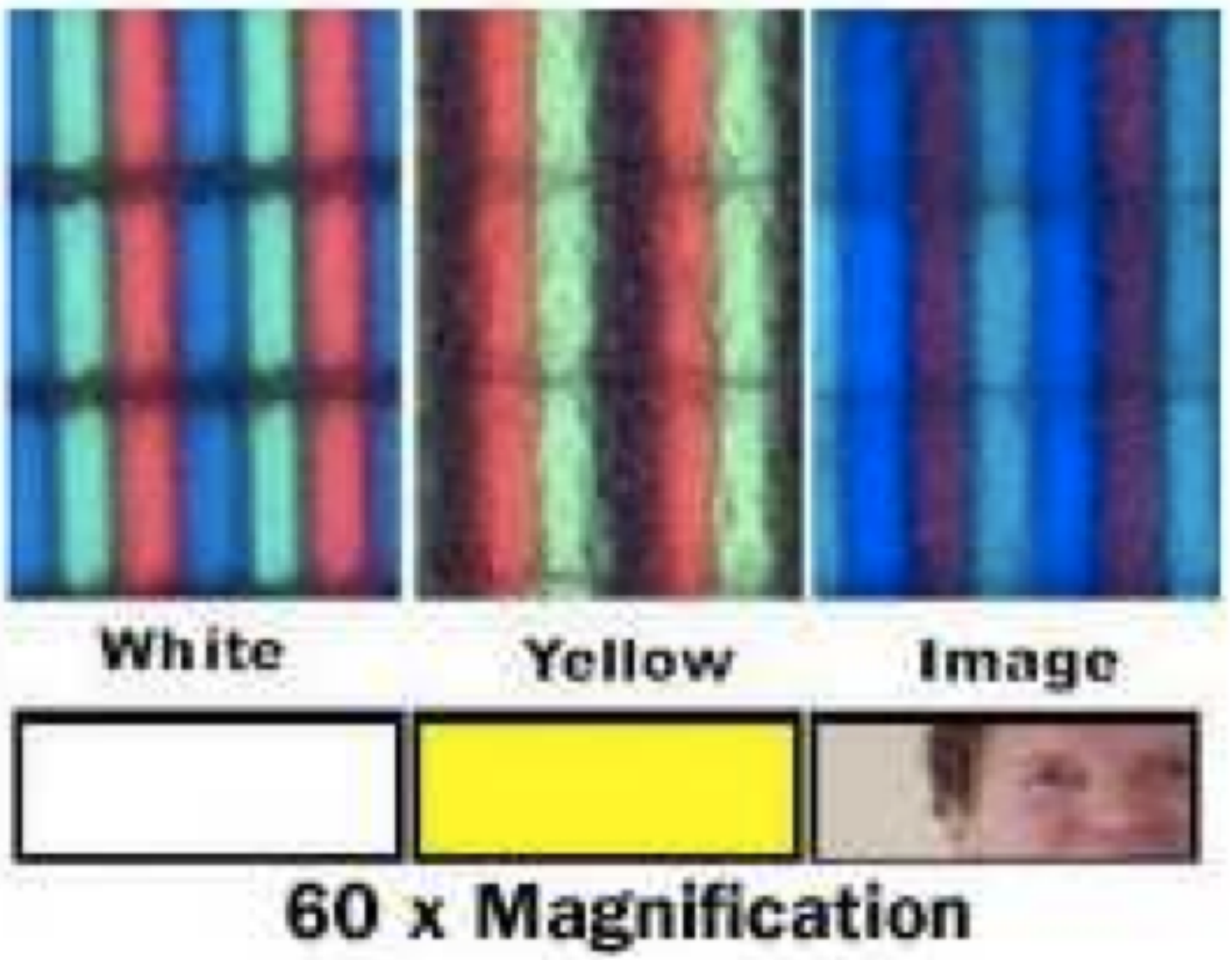


comparison of color gamuts

[wikipedia]

Raster Display





get different colors by combining **red, green, and blue subpixels**

Color Raster Image

- **R,G,B values stored at each pixel location**
- **each pixel value represents average color of the image over that pixel's area**