And let there be light...
Wave motion (wave tank)

- Diffraction
Wave motion (wave tank)

- Interference
Interference (examples)
Interfering waves
Wave interference

• Waves add

• Some places you get increased height (add in phase)

• Some places you get cancellation (add opposites)

• Spacing between high and low spots depends on wavelength
Interfering waves
Laser pointer
Stripes from interfering waves

1. A plane wave is incident on the double slit.
2. Waves spread out behind each slit.
3. The waves interfere in the region where they overlap.
4. Bright fringes occur where the antinodal lines intersect the viewing screen.
Color
Stripe spacing with color
Stripe spacing with color

- Blue-violet is the shortest
- Red is the longest
Color is wavelength of light

• Your brain tells you the wavelength encoded in color

• Blue-violet is shortest

• Red is longest

• There are shorter than blue (ultra-violet, x-ray, …)

• There are longer than red (infra-red, microwave, radio, …)
Bigger

- Laser
- Lens
- Half-silvered Mirror to split light
- Left path
- Mirror
- Right path
- Half-silvered Mirror to recombine light
- Stripes!
One photon at a time