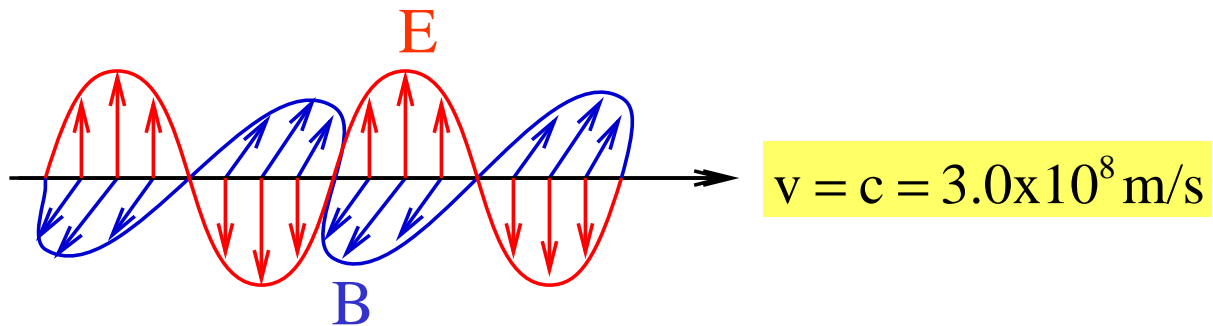


Physics 113 -Lecture 3

Light is a Transverse Wave



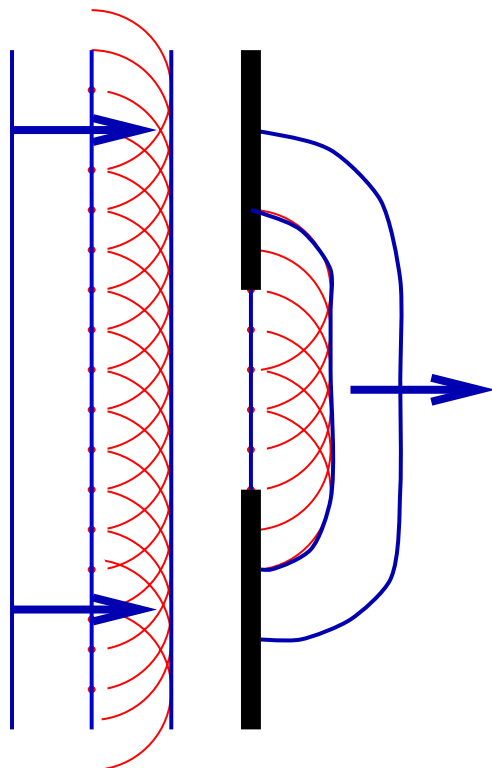
Maxwell (1864) - Light is an Electromagnetic wave

λ is small



$400 - 700 \times 10^{-9} \text{ m}$

Huygen's Principle - First Wave Theory (1580)



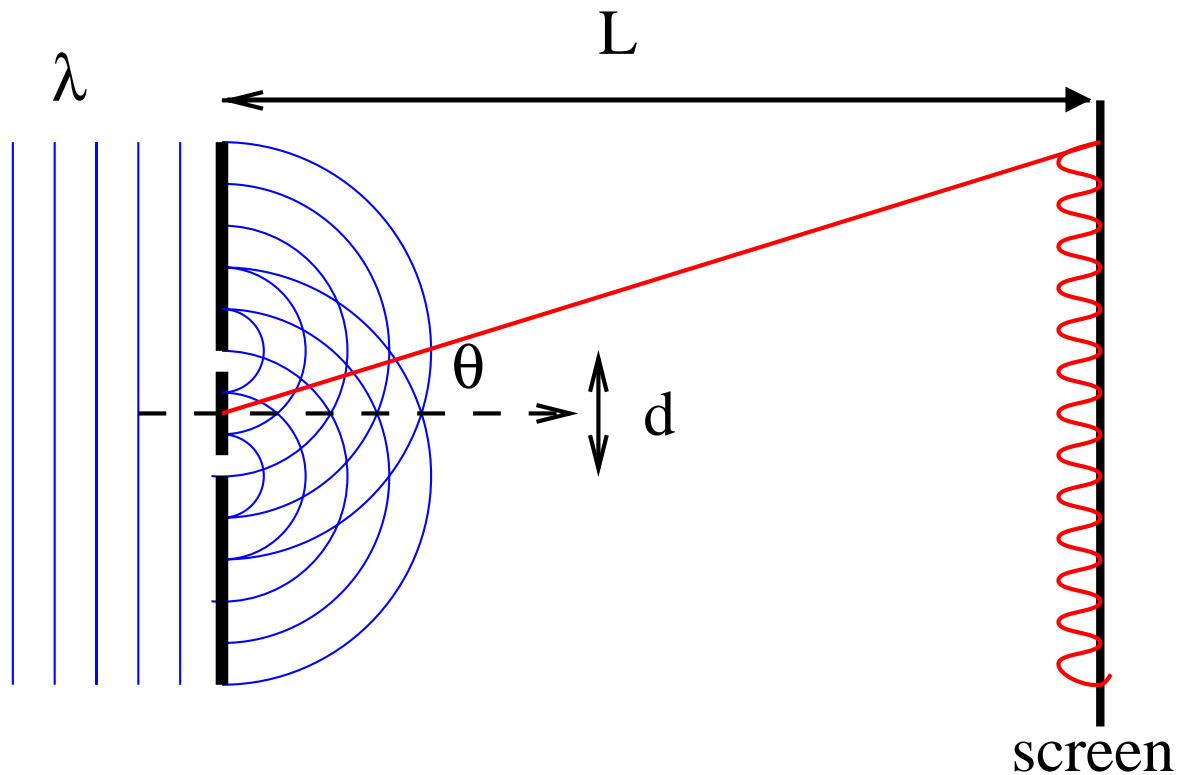
- A) every wave front is a point source of wavelets
- B) wavelets move radially with wave velocity
- C) wave at time t later is envelope of wavelets

Principle Explains:

- reflection
- refraction
- interference
- diffraction

Young's Experiment

Monochromatic light in phase enters double slit



$$\text{constructive : } d \sin \theta = m\lambda$$

$$\text{destructive : } d \sin \theta = (m + \frac{1}{2})\lambda$$

where $m = 0, 1, 2, 3, \dots$

Position on screen y

$$y = \frac{m\lambda L}{d} \quad \text{where } m = 0, 1, 2, \dots$$