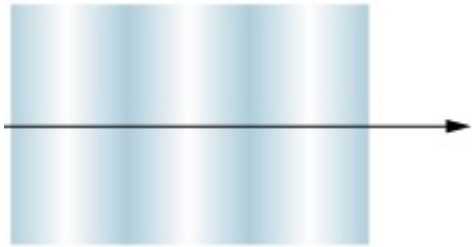


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# Phys 301 Class 13

## Lab: Double-Slit Interference

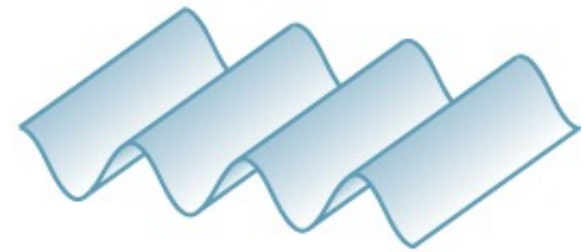
# A Different Way of Viewing Waves



View from above

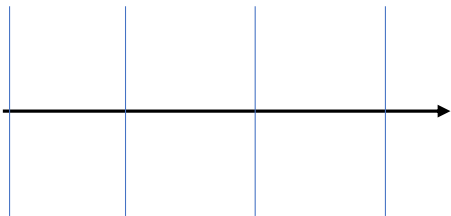


View from side

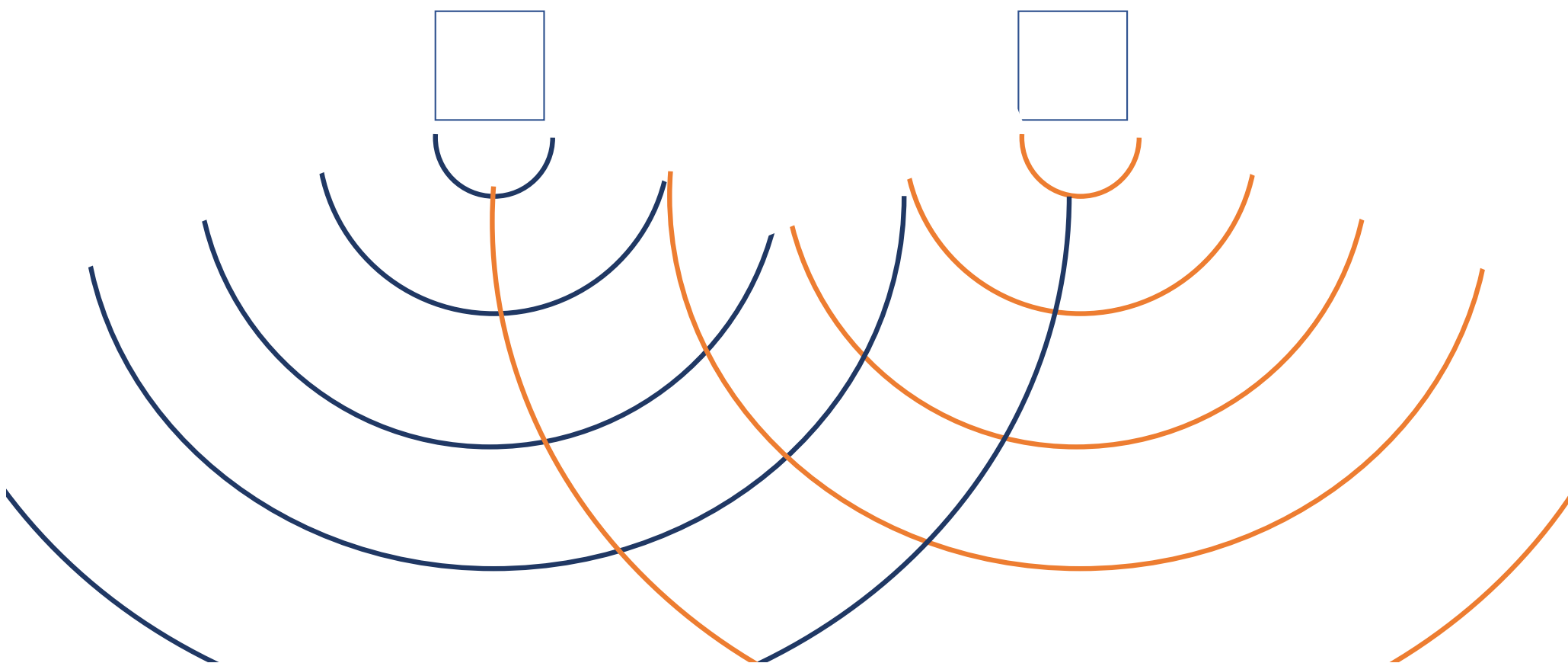


Overall view

or

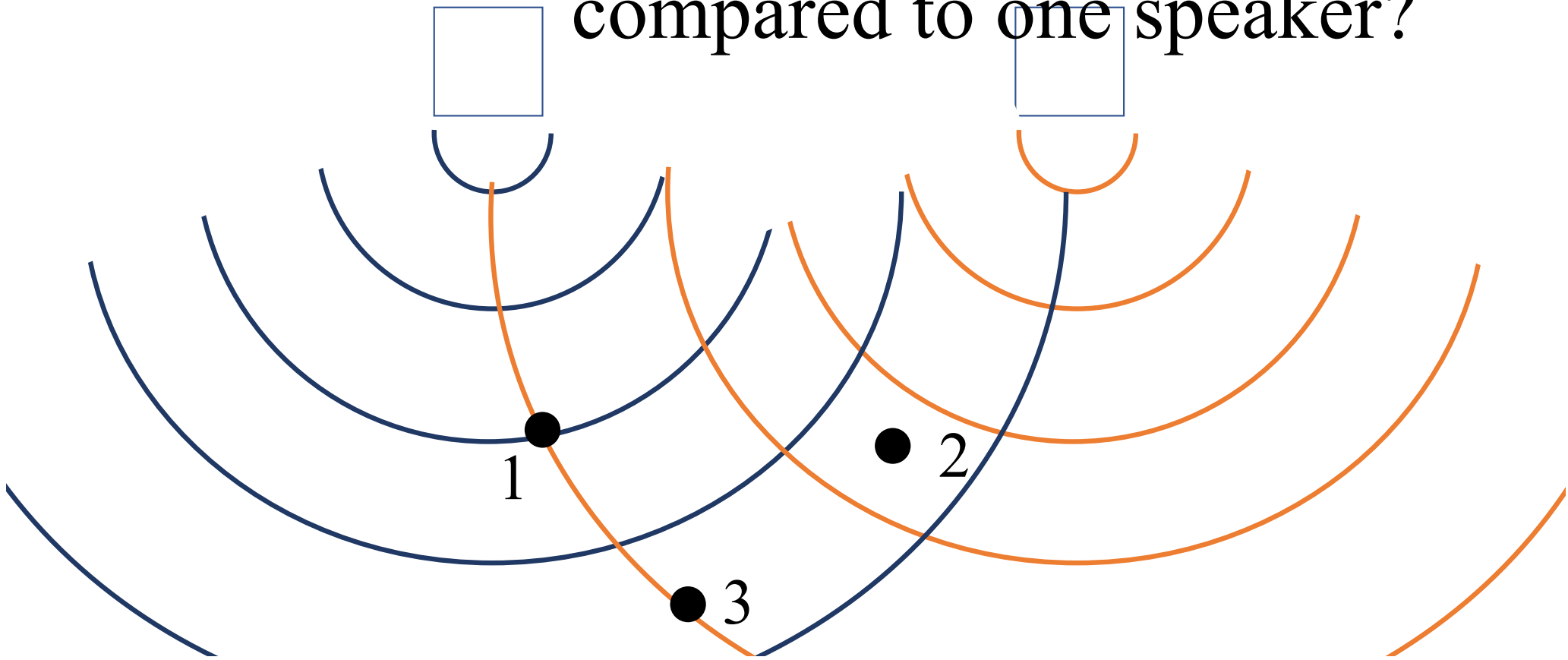


# Demo: Two Speakers



Demo

At position  $n$ , would sound be  
A: louder B: softer C: same  
compared to one speaker?



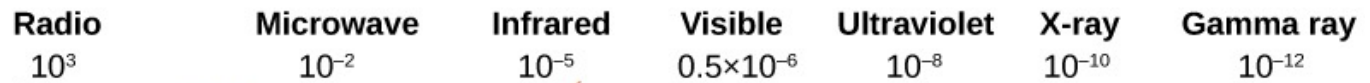
# The Electromagnetic Spectrum

$$\lambda = \frac{c}{f}$$

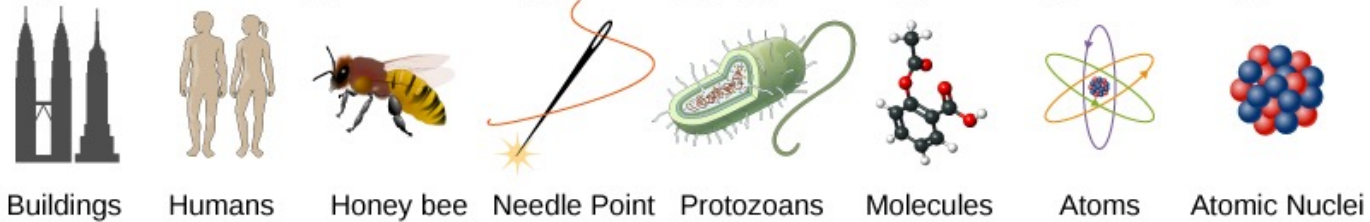
Penetrates Earth's atmosphere?



Radiation type  
Wavelength (m)



Approximate scale

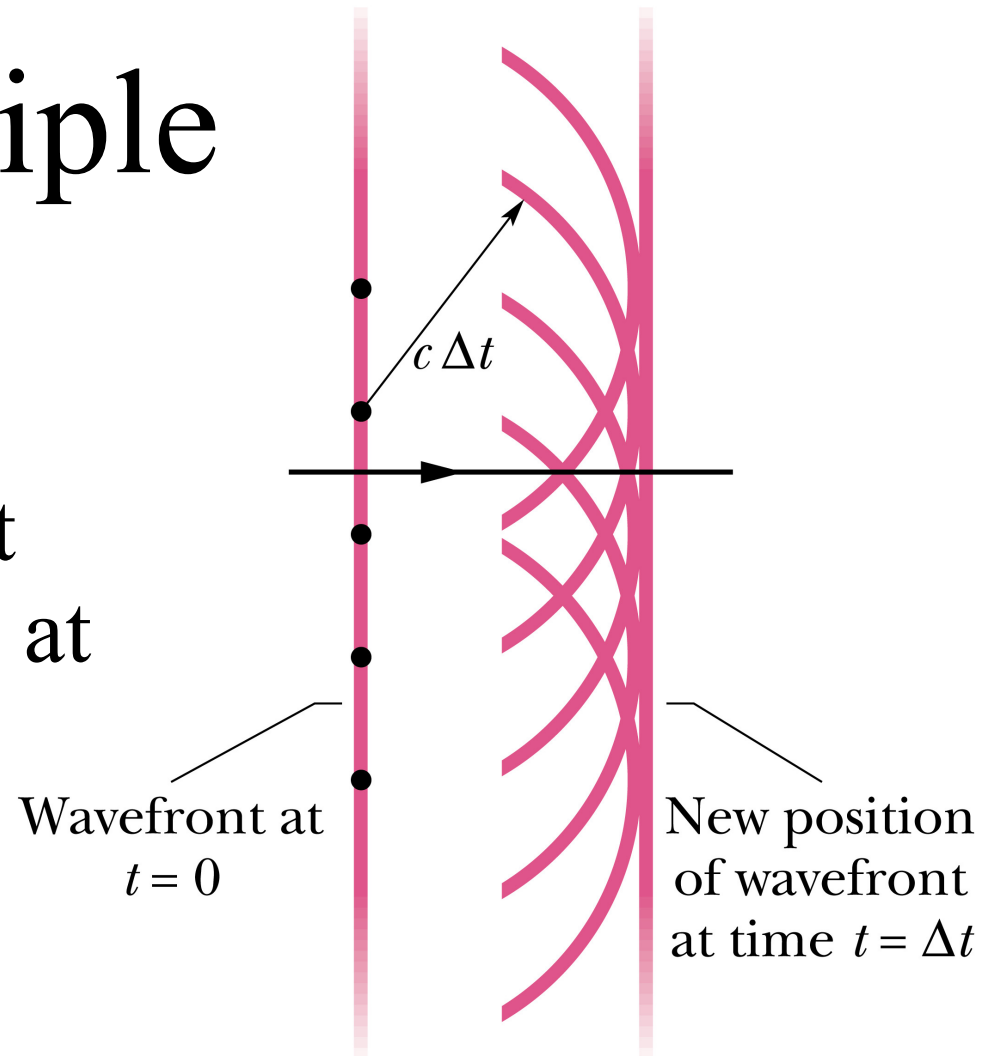


Frequency (Hz)

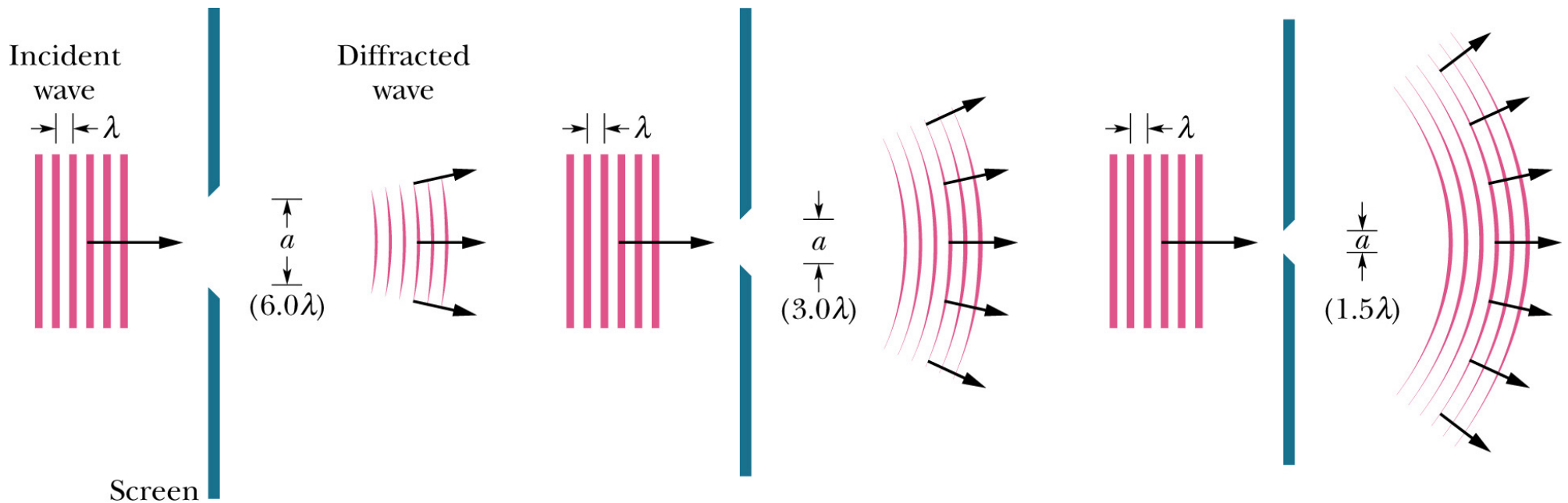


# Huygens' Principle

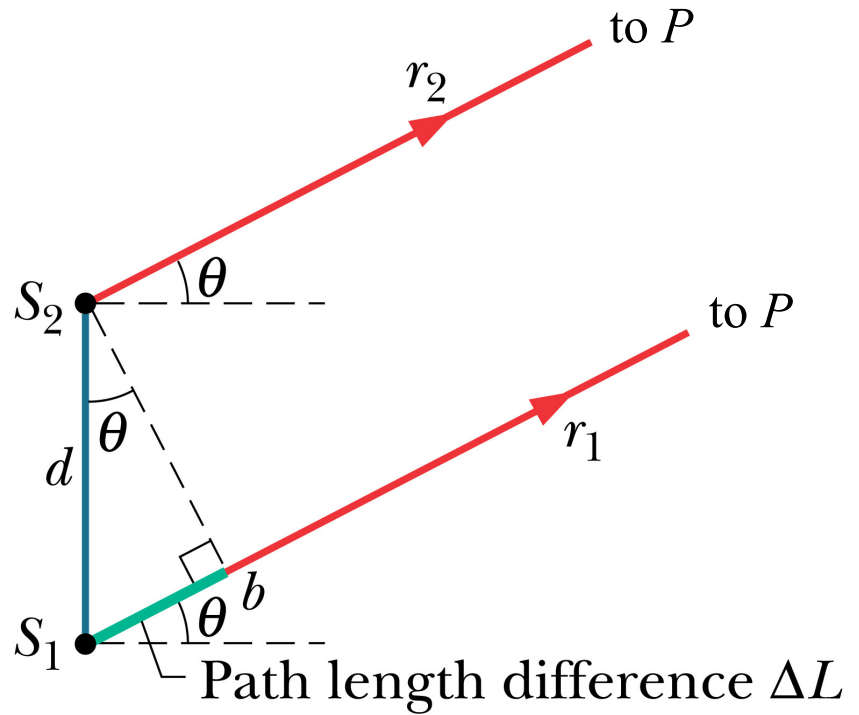
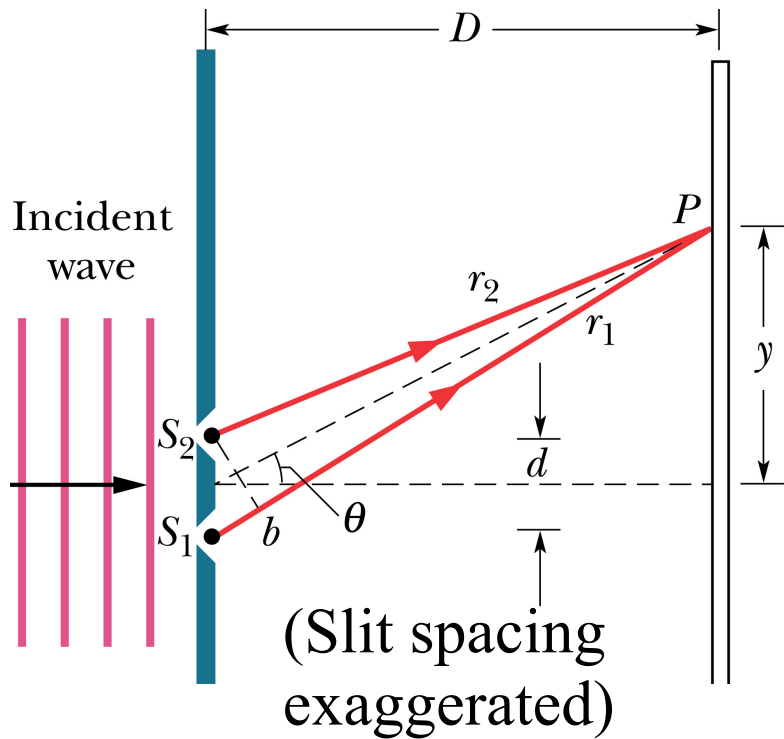
- “Every point on a wave front is a source of wavelets that spread out in the forward direction at the same speed as the wave itself.”



# Application of Huygens' Principle to Diffraction



# Mathematics of Interference

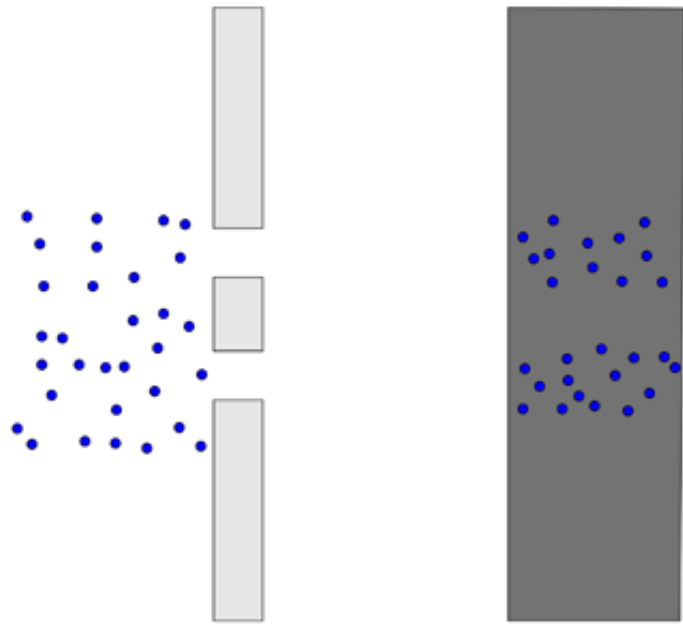


$$\Delta L = d \sin \theta$$

Constructive interference if  $d \sin \theta = m\lambda$

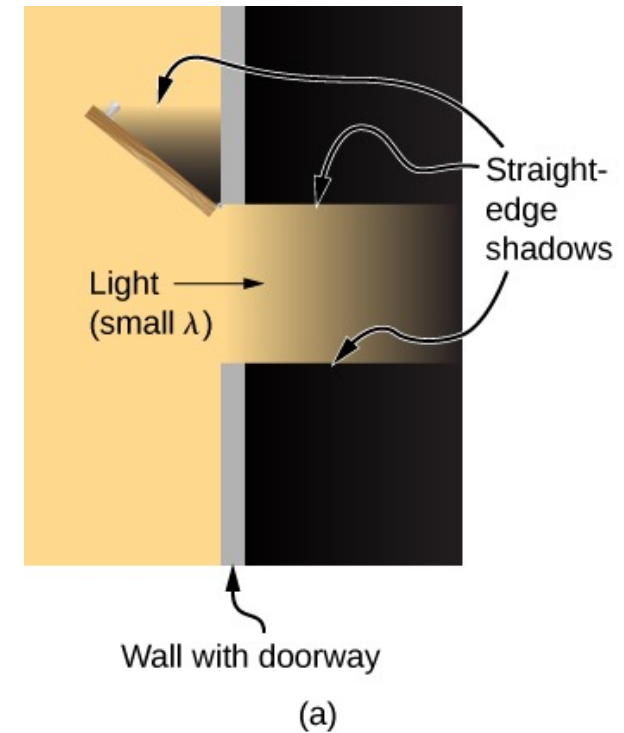


# If light were a particle, what would you expect to see?



- - OR - -

The view of waves with wavelengths much smaller than the slit widths.



The view of particles.

# Interference Lab

- Formal lab report as one homework grade, due Tuesday, October 24<sup>th</sup> (2 ½ weeks after lab).
- Demonstrate Question 2 now.
- Just in case... **DO NOT LOOK DIRECTLY AT THE LASER.**
- Likely have to complete analysis at home.