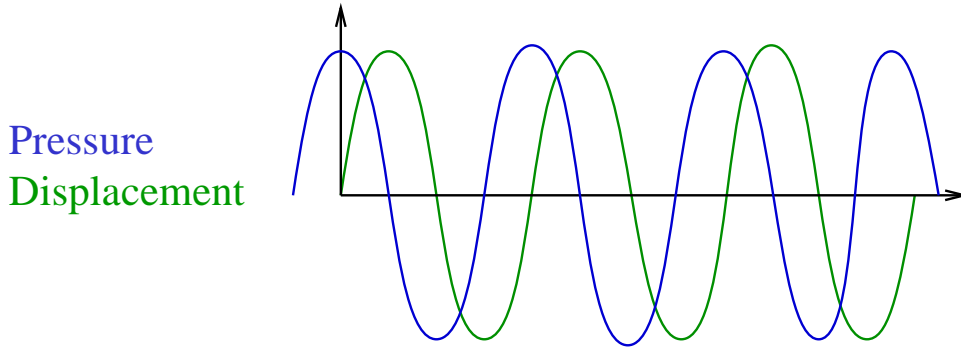
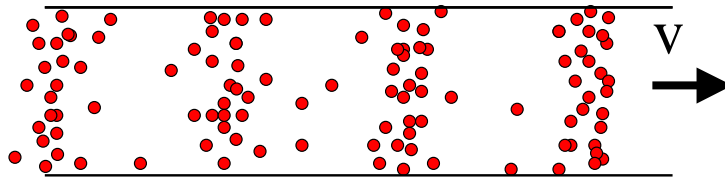


# Physics 113 -Lecture 2

## Sound Wave (Longitudinal)

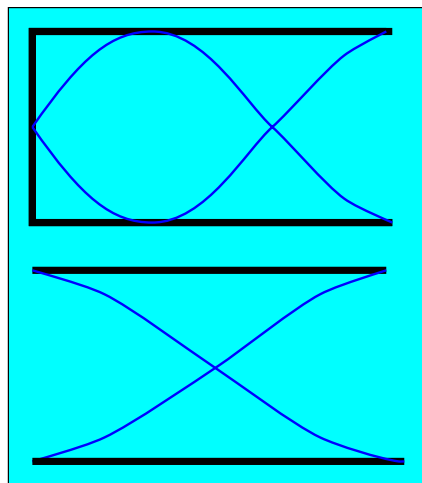


Humans can hear 20 Hz to 20000 Hz

$$v \approx (331 + 0.6 T) \text{ m/s}$$

## Standing Waves

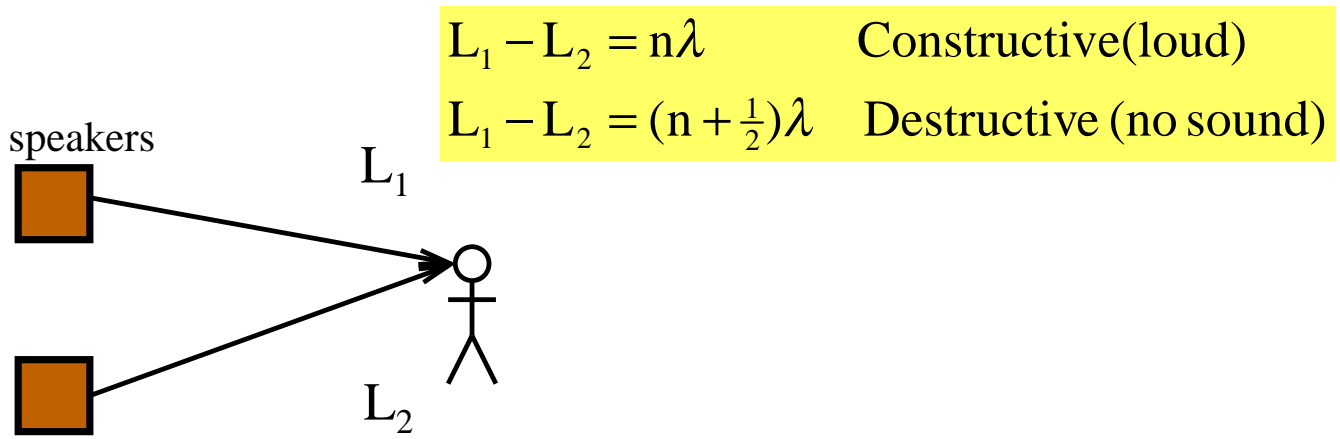
pressure node = displacement antinode  
pressure antinode = displacement node



$$f_n = \frac{nv}{4L} \quad n = 1, 3, 5, \dots$$

$$f_n = \frac{nv}{2L} \quad n = 1, 2, 3, \dots$$

# Interference



# Beats

Sound gets louder and softer at beat frequency

