Mechanical Waves: lecture 5

- Travel in a medium (c.f. EM waves in vacuum)
- Wave motion is a disturbance from the equilibrium state of the medium which propagates through the medium
- The medium can be thought of a collection of coupled oscillators
  - Transverse wave has oscillator vibrations perpendicular to the direction of travel
  - Longitudinal wave has oscillator vibrations parallel to the direction of travel
- Waves transport energy but **not matter** from one region to another

Examples

**Longitudinal wave**

**Transverse wave**

**Combination**
Wave Speed

The speed with which a disturbance propagates

Forced Oscillations
- Driven by a continuing periodic disturbance
- Consider the case of SHM disturbance since all periodic waves can be described as a sum of these
- Call these sinusoidal waves

Periodic Waves
- Driven by a continuing periodic disturbance
- Consider the case of SHM disturbance since all periodic waves can be described as a sum of these
- Call these sinusoidal waves

\[ y(t) = A \cos(\omega t + \phi) \]

\[ f = \frac{\omega}{2\pi} \]

\[ \nu = \lambda f \]