Physics 8.03
Vibrations and Waves

Lecture 20

Diffraction

Last time:
Interference from multiple sources

- Phased arrays
- Beaming

$$I = I_0 \left[\frac{\sin\left(N\delta/2\right)}{\sin\left(\delta/2\right)} \right]^2$$

$$\delta = \frac{2\pi}{\lambda} d \sin\psi + \Delta\phi$$

Diffraction

- What happens when EM wave hits a finite obstacle?
  - Shadows from edges of objects
  - Light passing through apertures 'bends'
- Formalism ➜ Huygens-Fresnel principle
  - Treat aperture as an array of many infinitesmal radiating sources that superpose (interfere)
- Examples ➜ systems with simple geometries
  - Rectangular slit
  - Circular aperture