

Physics 8.03

Vibrations and Waves

Lecture 12

Electromagnetic Wave Equation

HARMONIC OSCILLATORS

Free or Damped

Driven → **RESONANCE**

OPTICS
Multiple Sources
Interference
Diffraction

Final Exam

Exam 1

Exam 3

Exam 2

COUPLED OSCILLATORS

$N = \text{few} \rightarrow$ **NORMAL MODES**

$N = \text{many (continuous media)}$

→ MECHANICAL WAVES

wave equation...

ELECTROMAGNETISM
EM WAVES in vacuum
EM sources → **RADIATION**
EM waves in media
(conductors + dielectrics)

EM waves

- Maxwell's equations
 - Gauss's law
 - Faraday's law
 - Ampere's law
 - Some useful math
- Maxwell's equations in free space (vacuum)
 - EM wave equation
- Solutions to EM wave equation
 - Transverse plane polarized wave