Today	**Ch 27** Wave Optics	**HW23Redo, HW25**
Monday	**Ch 27** Wave Optics	**HW24Redo, HW 26**
Lab	**# 8 Wave Optics**	

Ch 27 Interference and the Wave Nature of Light

- **Introduction**
  - **Where we've been**:
  - **Where we're going:**

27.1 The Principle of Linear Superposition

- **Constructively Interfere**
- **Destructively Interfere**.
- **Total Destructive Interference**

27.2 Young's Double-slit Experiment

- **Demo**
  - **Quantitative**
    - **Constructive interference**
    - **Destructive interference**

- **Example1:** Say you have two slits 10μm apart. If you shine light through it and find that the angle to the *second dark* fringe off dead-ahead is 5.4°, what wavelength light must you be using?

27.3 Thin-Film Interference

- **coherent**
- **Path Length**
- **Number of Reflections**

- **Example2:** Say when light of wavelength 770 nm is ~ perpendicularly incident from air (n_a= 1) onto a thin film of soap (n_s = 1.4) floating on water (n_w = 1.33) the reflected light is minimized. What is the thinnest (non-zero) the film can be?

- **Application**

27.4 Diffraction

- **Getting quantitative**

HW 26

2. In a Young's double-slit experiment, the seventh dark fringe is located 0.025 m to the side of the central bright fringe on a flat screen, which is 1.1 m away from the slits. The separation between the slits is 1.4×10^{-4}m. What is the wavelength of the light being used?

10. Light of wavelength 691 nm (in vacuum) is incident perpendicularly on a soap film (n=1.33) suspended in air. What are the two smallest nonzero film thicknesses (in nm) for which the reflected light undergoes constructive interference?

20. A slit whose width is 4.30×10^{-5}m is located 1.32 m from a flat screen. Light shines through the slit and falls on the screen. Find the width of the central fringe of the diffractin pattern when the wavelength of the light is 635 nm.