

Monday, October 22

Ford Chs: 8&9

## Agenda

- Announce:
  - Test Two Weeks From Wednesday
- Calendar:
  - Oct 24
  - Oct 29
  - Oct 31—Movie
  - Nov 5—Review 9&10
  - Nov 7—Test2
- Project Ideas due by Halloween
- Ch. 8
- Ch. 9

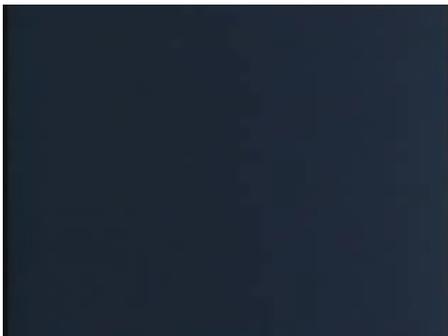
## Ch.8

- Conservation Laws
  - Energy, Momentum, Angular Momentum, Charge
  - Baryon number, Lepton number, color, TCP
- Invariance Principles
- Symmetries
  - Homogeneity
  - Isotropy
  - Temporal invariance/symmetry

## Ch. 9

- Particles are Waves
  - Electrons are waves (e.g. double slit, electron imaging a crystal)
  - Photons are waves (e.g. shadows a bit fuzzy)
- Waves are Particles
  - Light is photons (photoelectric effect)

## Electrons Sent Through a Double Slit



## Momentum versus Wavelength

- For massive objects:
  - High momentum means small wavelength (very localized)

## Electrons in the Atom

- Finally a good explanation
- Electrons reach a balance
  - Charge attracts electron to nucleus
  - Electron “wants” to stay far away to minimize its momentum/energy
- QM can now solve for the states of the electron in atoms...

## Wavefunction

- QM finds the wavefunction for a particle  $\psi(x, y, z)$
- It's square gives a probability  $|\psi(x, y, z)|^2$