Today	**Ch 19** 2st 1/3rd Electric Potential	**Redo8; HW10**
Wednesday	**Ch 19** 3rd 1/3rd Electric Potential	**Redo9; HW11**
Lab	**3, Electrostatics**	

Simple Applications

Example 1: Parallel Plate Capacitor Revisited: The two charged plates we considered before are held at a potential difference of 10 kV, say the – plate at –5kV and the + plate at + 5kV. The electron is injected through the hole in the – plate and is accelerated by the electric field as it flies toward the hole in the + plate. How fast is it going when it reaches the + plate?

Example2: *Sandblasting with electrons.*

If this condition is met when the electrons hit the surface at about 9.4×10^5 m/s, (a) How much work is done in accelerating the electron from rest? (b) what is the potential difference, $V_s - V_t$?

19.1 The Electric Potential Difference due to Point Charges

Point Charges: Force, Field, Potential Energy, and Potential

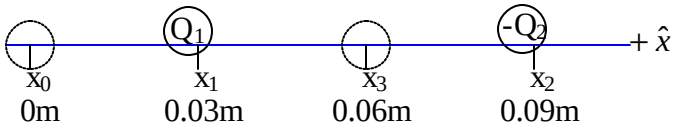
- **Electric Force**
- **Electric Field**
- **Work**
- **change in Electric Potential Energy**
  - **Ex 3: Potential Energy**: What is the change in potential energy of an electron and a proton if they are brought in from infinity to their Hydrogen ground state separation of 5.29×10^{-11}m?
  - **Ionization**
- **Electric Potential**
  - **Reference point**

Example 4: Potential: What is the difference in electric potential r_{bohr} from the proton vs. infinitely far from the proton? $r_{Bohr} = 5.29\times10^{-11}$m.

Pause: Summing up the electric interaction equations encountered thus far:

- **Electric Force**:
- **Electric Field**:
- **Work:**
- **Electric Potential Energy:**
- **Electric Potential:**
- **eV**
  - **the *other* acceptable unit of energy.**
  - **eV, U-V, and Life as we know it**

Ex 5: 2 Charge What is the electric potential at x_0 and x_3 (relative to infinity)?



6. Point A is at a potential of +250 V, and point B is at a potential of – 150V. An α-particle (i.e. a helium nucleus containing two protons and two neutrons) starts from rest at A and accelerates toward B. When the particle arrives at B, what kinetic energy (in electron volts, eV) does it have?

12. Two point charges, +3.40 μC and -6.10 μC, are separated by 1.20 m. What is the electric potential midway between them?

14. Location A is 3.00 m to the right of a point charge q. Location B lies on the same line and is 4.00 m to the right of the charge. The potential difference between the two locations is V_B-V_A = 45.0 V. What is the magnitude and sign of the charge?

16. The drawing shows four point charges. The value of q is 2.0 μC, and the distance d is 0.96 m. Find the total potential at the location P. Assume that the potential of a point charge at infinity is zero.