Interactive Problem Set 11, SP212 Spring 2013

Topic: 24.10 - 24.12, Electric Potential Energy, Conductors

IPS 11.1 (in-class) Revisit IPS 4.1 but now calculate the electric potential instead of the electric field.

IPS 11.2 (homework) Review your work from IPS 4.1 and IPS 11.1.

- Add to your solutions anywhere you find it difficult to reconstruct the story in all its details for each of these problems.
- Compare the methods of these two problems, they are quite different because $\vec{E}$ is a vector field and V is a scalar field. Make a list of the key points that will allow you to not confuse how to solve each type of problem.

IPS 11.3 (in-class) Revisit IPS 1.1 but now calculate the total energy required to assemble these charges on this square starting with these these charges at infinity at the four corners of the edge of the universe.

IPS 11.4 (homework) Redo the above problem but with this alternate method: View every possible charge pair as an interaction that contains energy. Make sure you cover all your bases! The energy stored in a single interaction is,

$$U = k\frac{q_1 q_2}{r}.$$

Make sure you get the same answer!

IPS 11.5 (in-class) Two conducting spheres are very far apart. One is of radius 0.700 m and contains a total charge of +100 nC. The other is of radius 0.300 m and is neutral. A very long wire is installed to connect the two conductors. What is the charge on each of these spheres now?

Prep for next class: WPC Chapter 25.