Applications of Big Ideas

Conductors
Charges free to move

What Determines
How They Move?

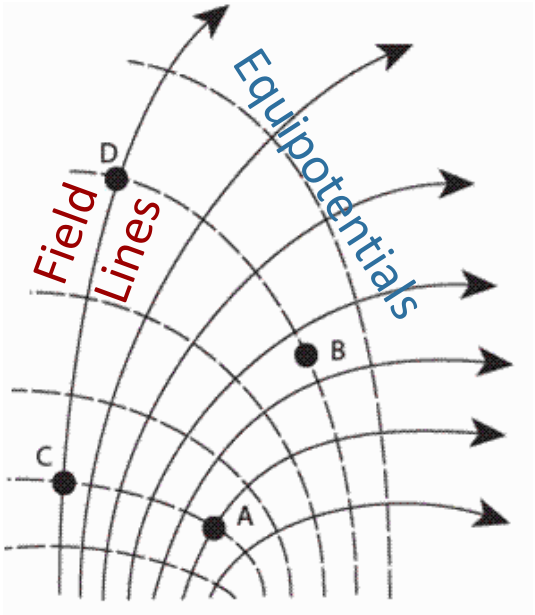
They move until
$E = 0$!

$E = 0$ in conductor determines charge densities on surfaces

Gauss' Law

Spheres
Cylinders
Infinite Planes

Field Lines & Equipotentials



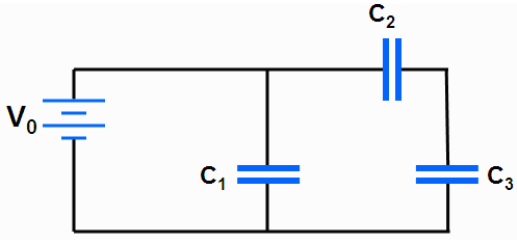
Work Done By E Field

$$W_{a\to b} = \int_a^b \vec{F}\cdot d\vec{l} = \int_a^b q\vec{E}\cdot d\vec{l}$$

Change in Potential Energy

$$\Delta U_{a\to b} = -W_{a\to b} = -\int_a^b q\vec{E}\cdot d\vec{l}$$

Capacitor Networks



Series:

$$(1/C_{23}) = (1/C_2) + (1/C_3)$$

Parallel

$$C_{123} = C_1 + C_{23}$$