

## 1 | Conductors at Equilibrium

If the charges on a conductor are **stationary**, no electron flow within the conductor... This means that

- 1) E-field *in* the conducting material must be zero
  - Because, uhh...., the conductor is stationary, meaning no electron flow
  - So, without electric flow, you know that there is no electrons flowing, which means no electric field

### Charged Conductors at Equilibrium

- 2) Any electrons would cluster at the surface of the conductor
  - At equilibrium, the electrons would want to be as far away from each other as possible, meaning that they would stick to the surface — the part of the conductor w/ biggest perimeter/circumference
- 3) At the surface of the conductor, if any E-field is present, it must be perpendicular to the surface
  - If you have a horizontal component, the conductor would be, well, *conducting* electricity, making it rather not static
  - If the E-Field is perpendicular, because we are in the Physics Vacuum, no charges will flow because it can't flow out of the conductor into something else

The net electric field inside a neutral conductor must be 0 equilibrium (at which point it is stationary)

- At curves, a conductor at equilibrium would cluster to maintain perpendicularity
- Electrons tend to flow into corners
  - Because there are more electrons towards the center and across the conductor to push all electrons towards the extremities
  - 20phys201srcChargeFlowInConductors.png
  - PhET Exploration: [KBe20phys201retFieldsVoltagePhET](#)