

Charged Conductor at Equilibrium (1)



- Consider a conductor with excess charge Q in isolation.
- The mobile charges (electrons) are rearranged spontaneously until we have $\vec{E}_0 = 0$ everywhere inside the conductor.
- If $\vec{E}_0 = 0$ inside the conductor, then Gauss's law implies that there can be no net flux through any Gaussian surface that is inside the conductor.
- Hence there can be no net charge in any region inside the conductor.
- Hence all excess charge must be at the surface, where it produces an electric field $\vec{E}_0(\vec{r})$ on the outside only.

