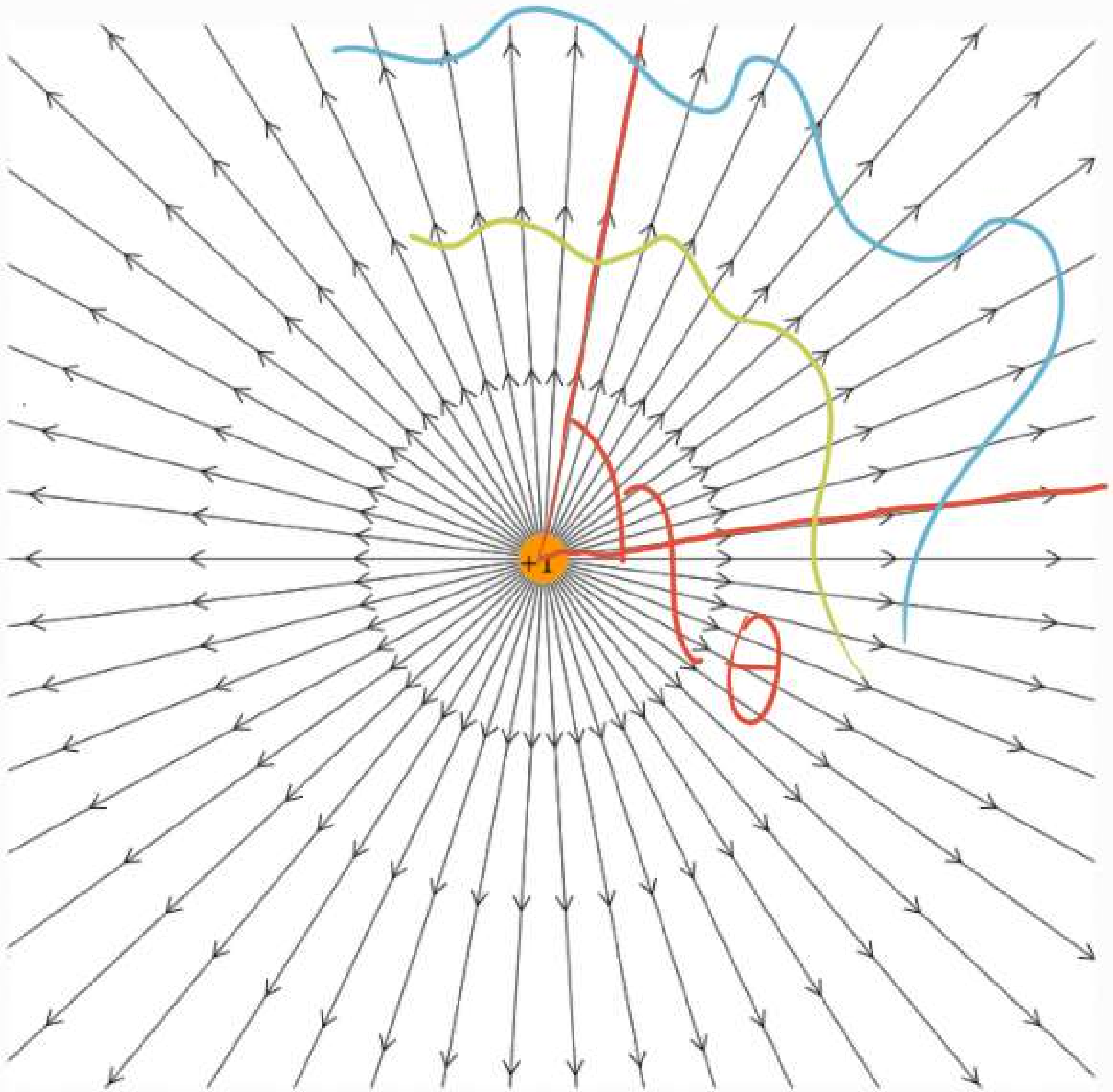
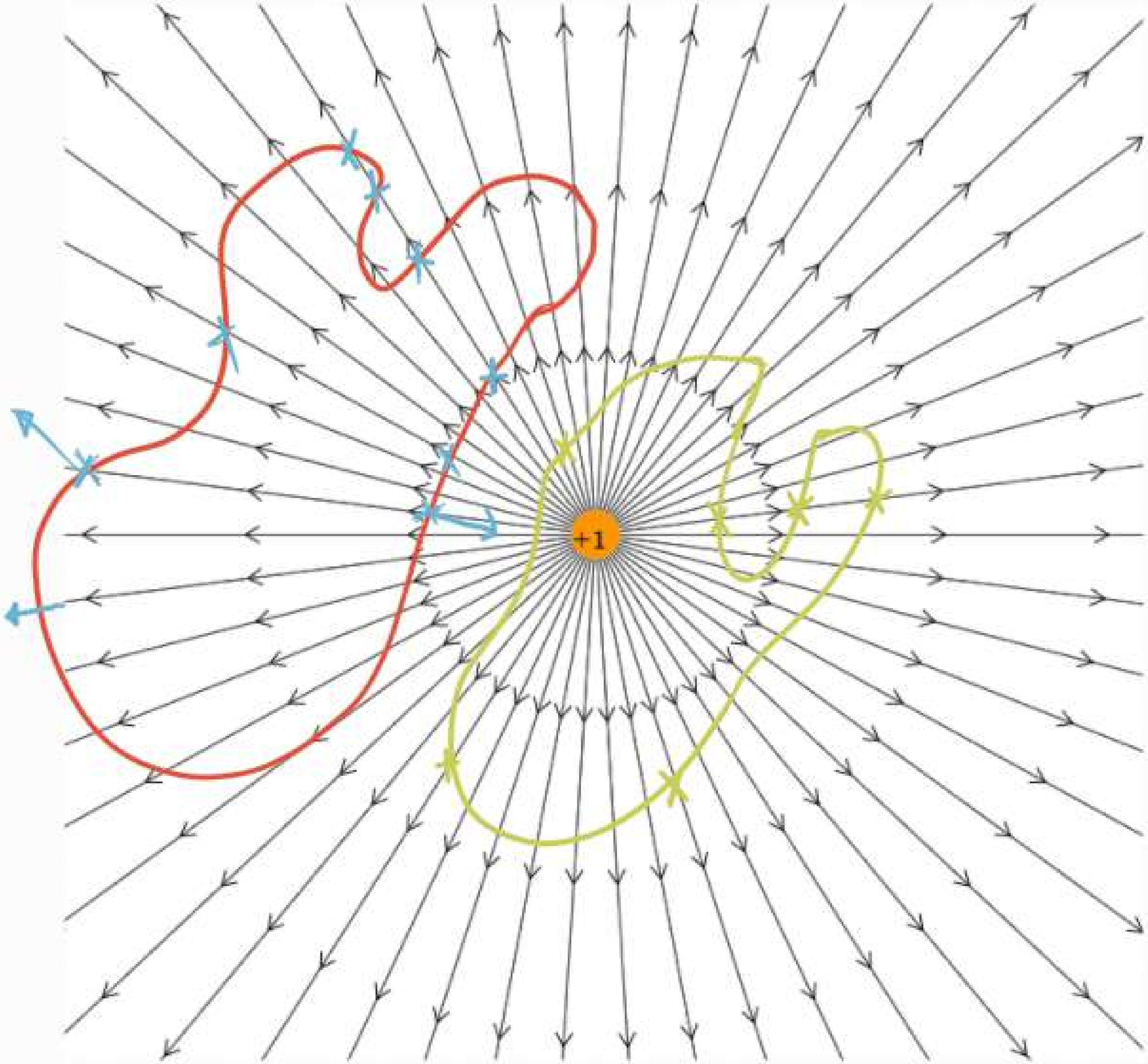
$$\int_{\Sigma} \vec{E} \cdot \hat{n}\, d\Sigma = \frac{Q_\Sigma}{\varepsilon_0}$$



$\phi(\vec{E}) = 0$



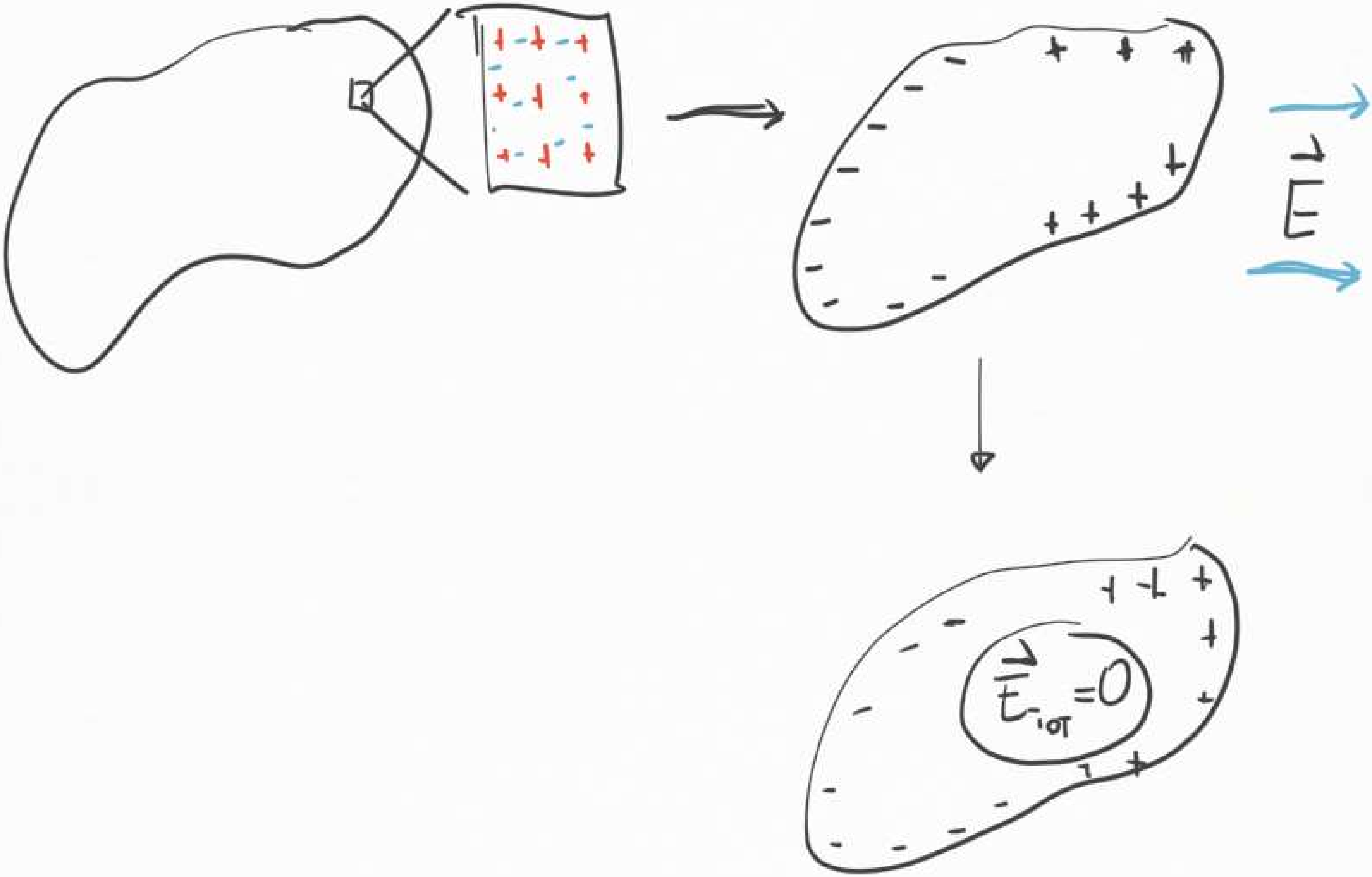
$\phi(\vec{E}) > 0$

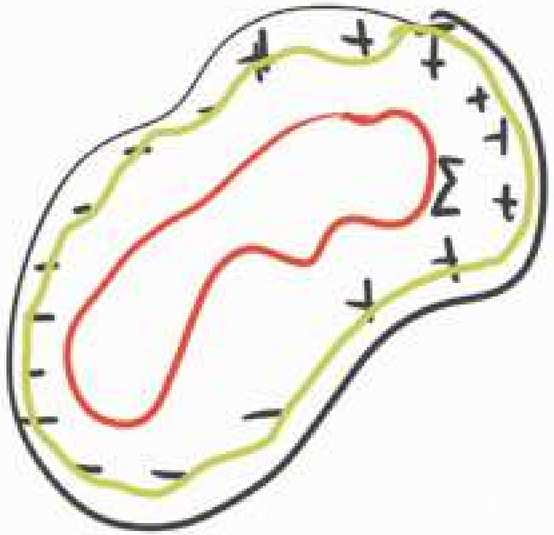
$$\boxed{\phi_{\Sigma}(\vec{E}) = \frac{Q_{\Sigma}}{\varepsilon_0}}$$

$$\int_{\Sigma} \vec{E} \cdot \hat{n}\, d\Sigma = \int_{\tau_\Sigma} \vec{\nabla} \cdot \vec{E}\, d\tau = \int_{\tau_\Sigma} \mathrm{div}\, \vec{E}\, d\tau, \quad \vec{\nabla} \cdot \vec{E} = \frac{\partial E_x}{\partial x} + \frac{\partial E_y}{\partial y} + \frac{\partial E_z}{\partial z}$$

$$\boxed{\int_{\tau_\Sigma} \vec{\nabla} \cdot \vec{E}\, d\tau} = \frac{Q_\Sigma}{\varepsilon_0} = \frac{1}{\varepsilon_0} \int_{\tau_\Sigma} dq = \boxed{\frac{1}{\varepsilon_0} \int_{\tau_\Sigma} \rho\, d\tau} \Rightarrow$$

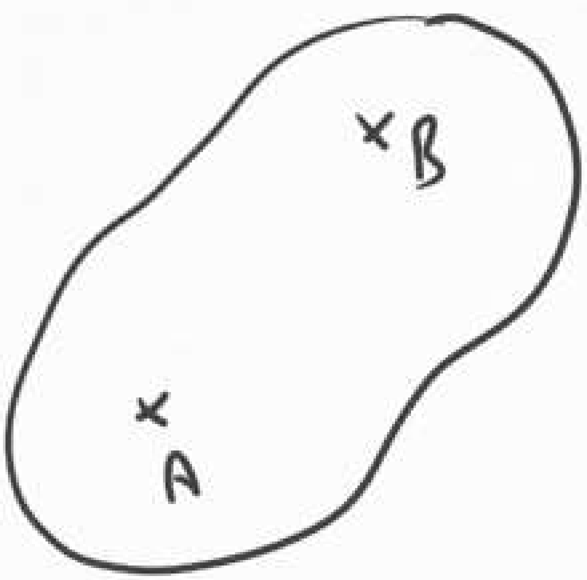
$$\underline{\vec{\nabla} \cdot \vec{E}} = \underline{\frac{\rho}{\varepsilon_0}}$$


$\vec{E}$
$\vec{E}_{tot}=0$

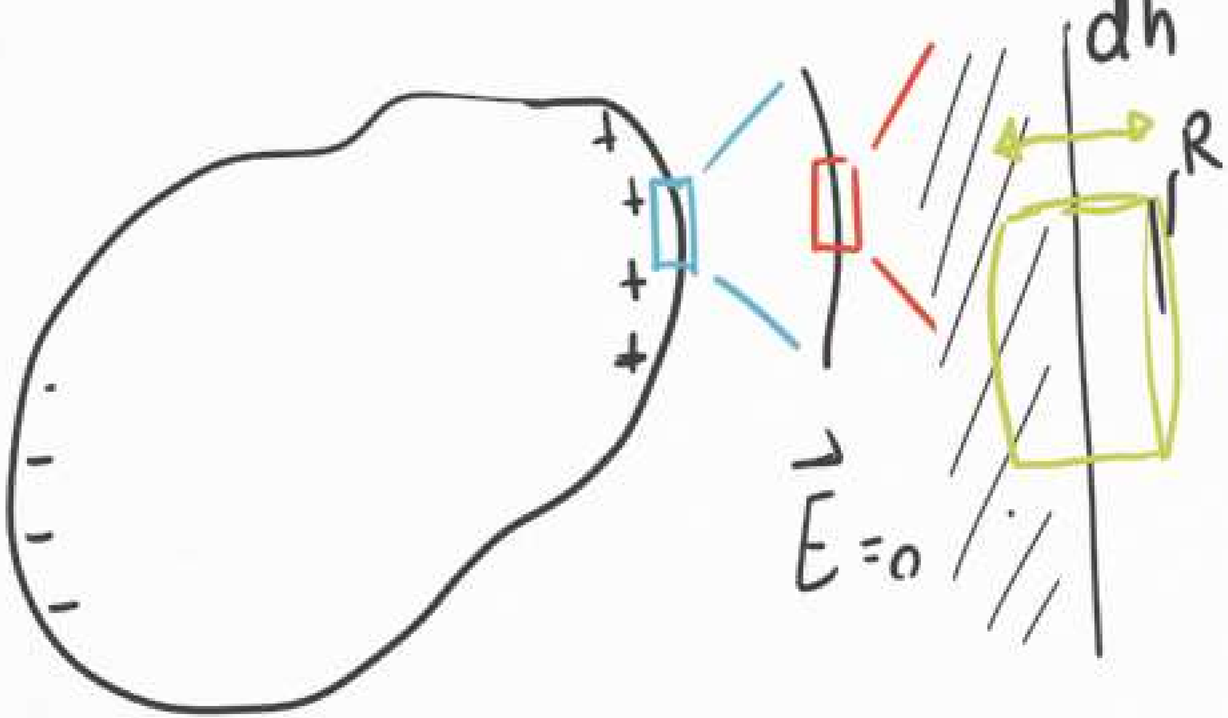


$$\int_\Sigma \vec{E}\cdot\hat{n}\, d\Sigma = 0 = \frac{Q_\Sigma}{\varepsilon_0}$$

$$\int_\Sigma \vec{E}\cdot\hat{n}\, d\Sigma = 0$$



$$\Delta V_{AB} = -\int_B^A \vec{E}\cdot d\vec{s} = 0 \Rightarrow V(x,y,z) = \text{cost}$$

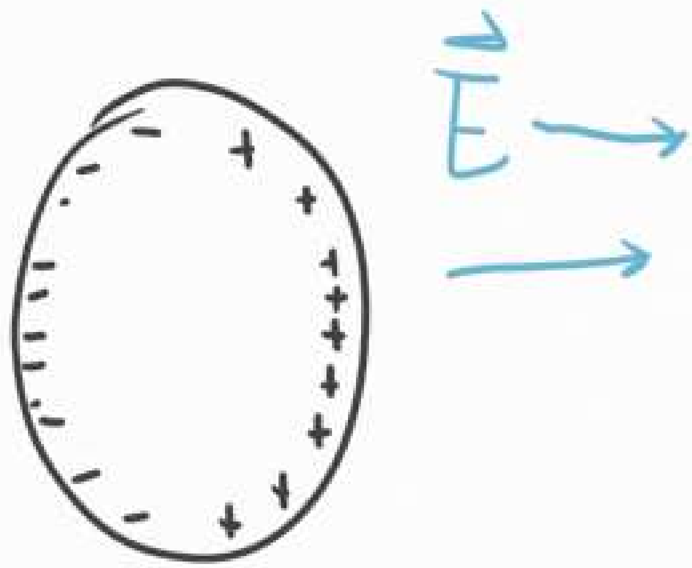


$$\Phi_\Sigma(\vec{E}) = E\,\pi R^2 = \frac{\sigma \pi R^2}{\varepsilon_0} \Rightarrow$$

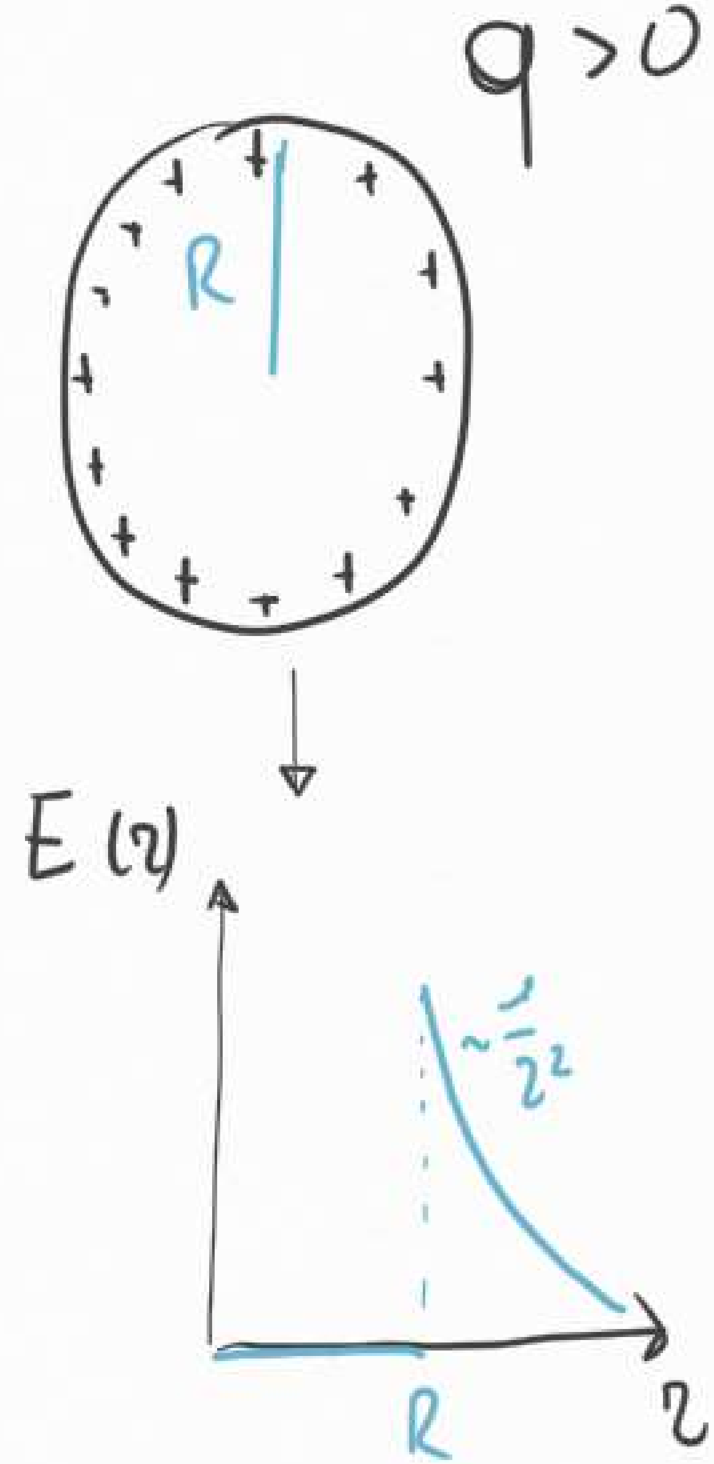
$$\boxed{E = \frac{\sigma}{\varepsilon_0} \quad \text{TEOREMA DI COULOMB}}$$

σ

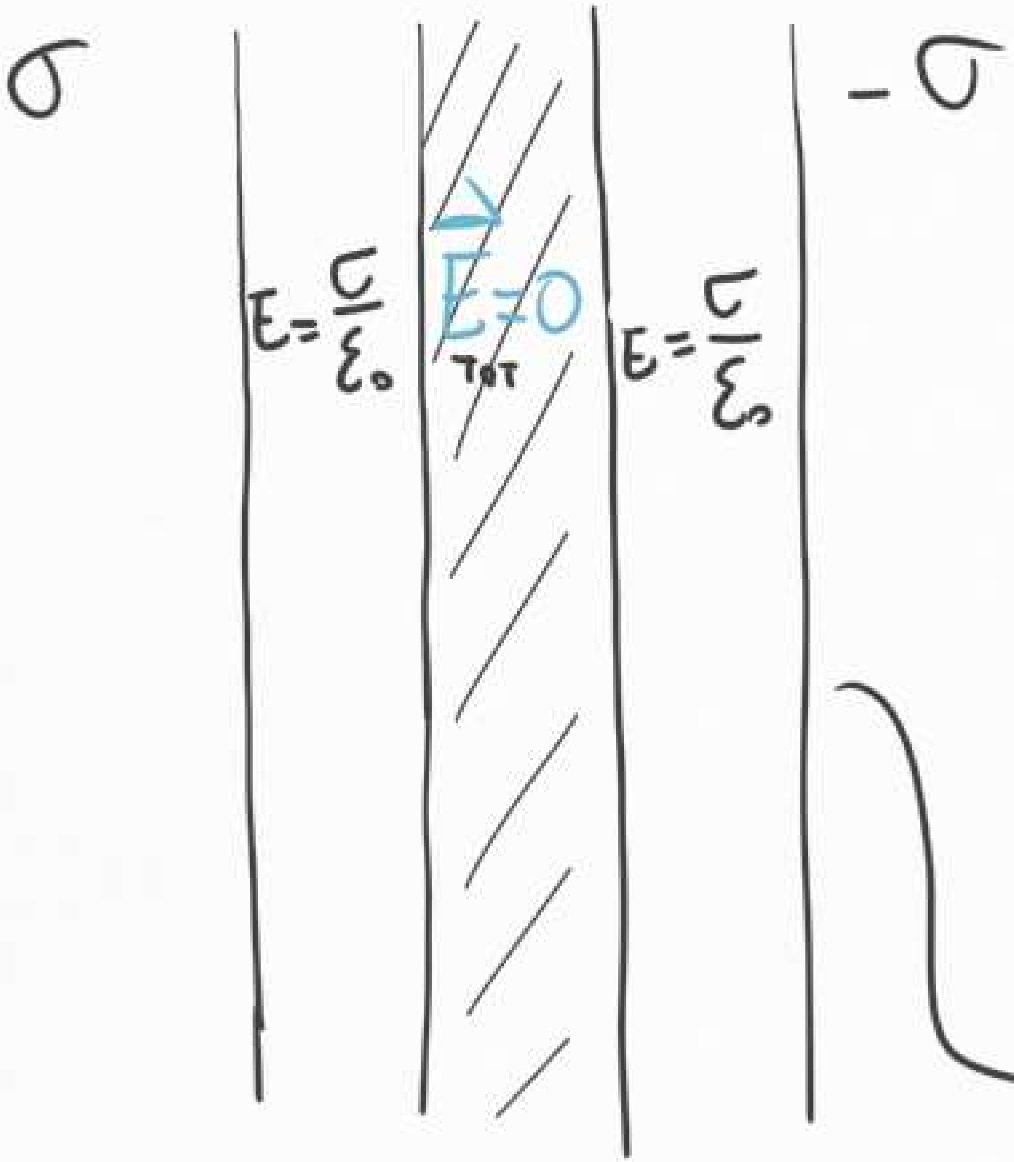
$$E = \frac{\sigma}{2\varepsilon_0}$$



$\vec{E}$



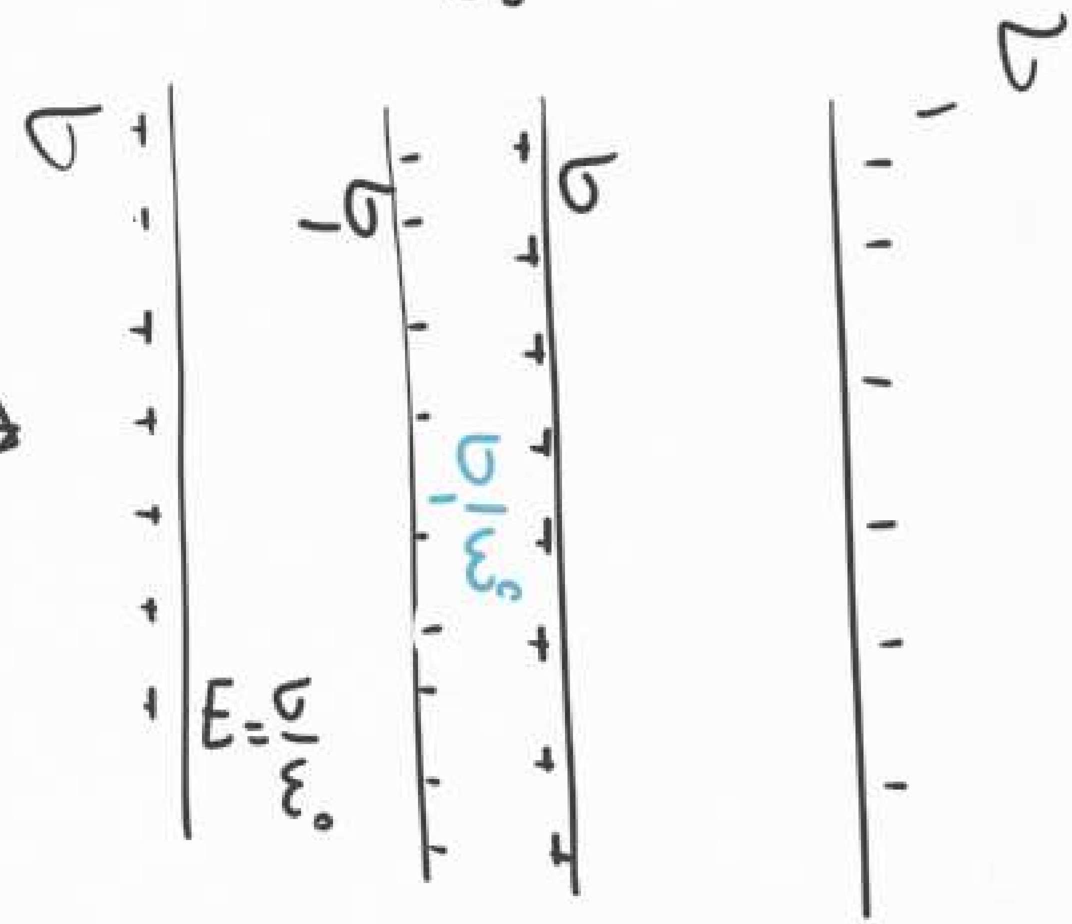
$q > 0$
R
$E(r)$
$\sim \frac{1}{r^2}$
R
r

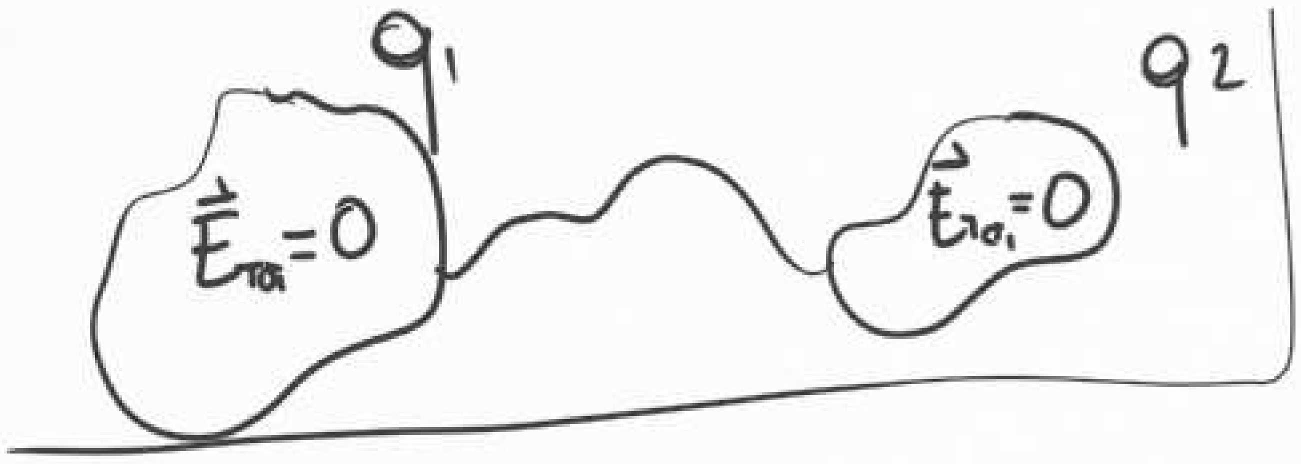


$$\vec{E}_{TOT} = \vec{E} + \vec{E}_i \Rightarrow$$

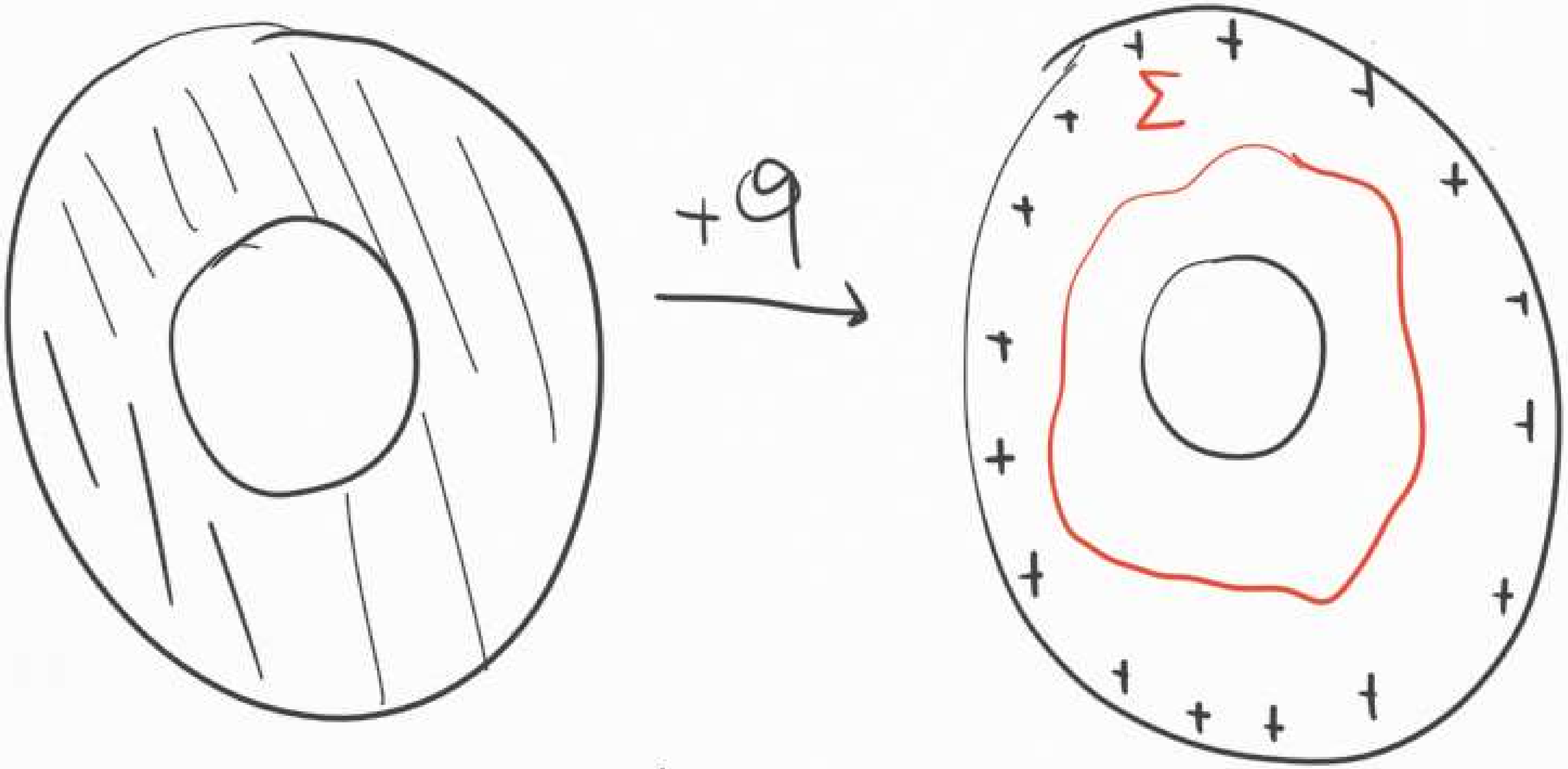
$$E_{TOT} = \frac{\sigma}{\varepsilon_0} + E_i = 0 \Rightarrow$$

$$E_i = -\frac{\sigma}{\varepsilon_0}$$

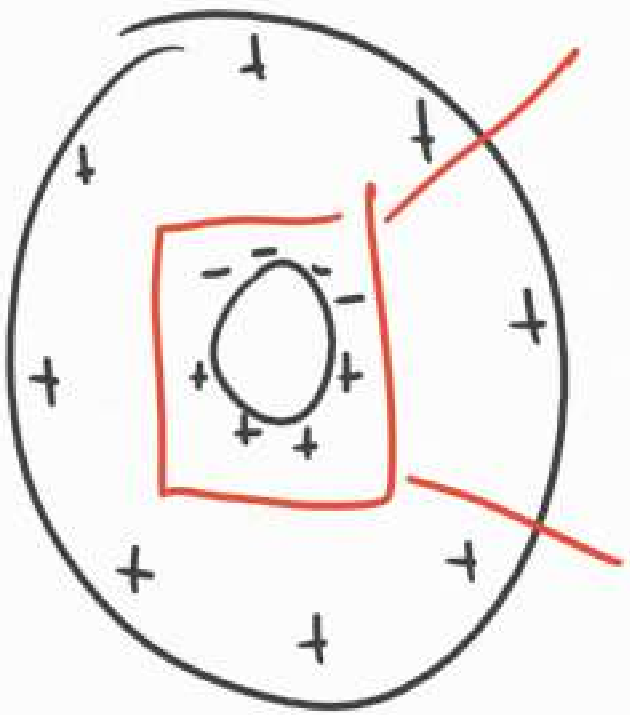


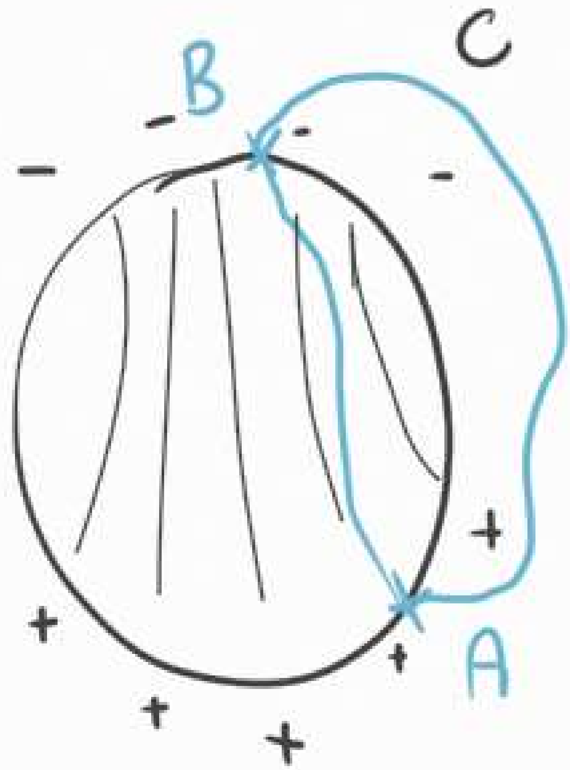


q_1
q_2
$\vec{E}_{TOT} = 0$
$\vec{E}_{TOT} = 0$



$$\int_\Sigma \vec{E}\cdot\hat{n}\, d\Sigma = 0 = \frac{Q_\Sigma}{\varepsilon_0} \Rightarrow Q_\Sigma = 0$$

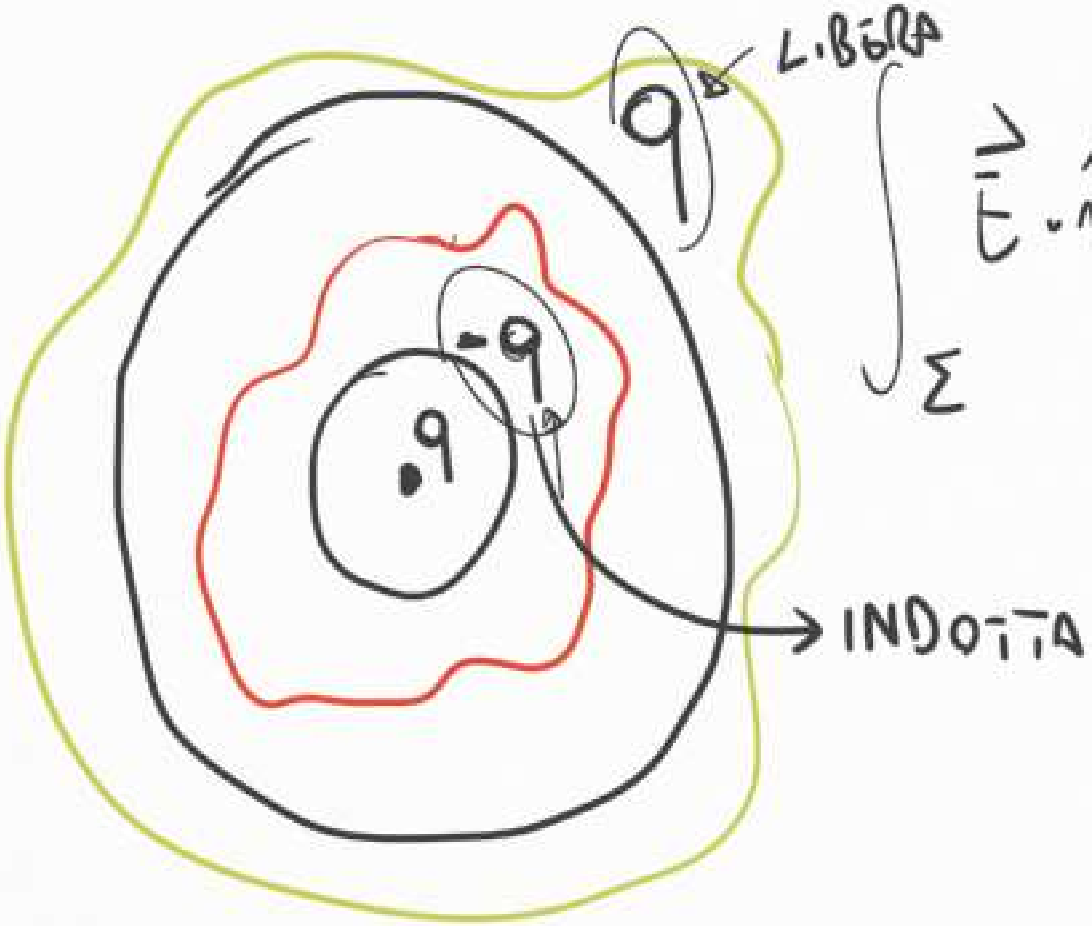




$$\oint_C \vec{E}\cdot d\vec{s} = 0 =$$

$$\int_A^B \vec{E}\cdot d\vec{s} + \cancel{\int_B^A \vec{E}\cdot d\vec{s}} = 0$$

$$\Rightarrow \vec{E} = 0$$



$$\int_{\Sigma} \vec{E} \cdot \hat{n} \, d\Sigma = 0$$

GABBIA DI FARADAY

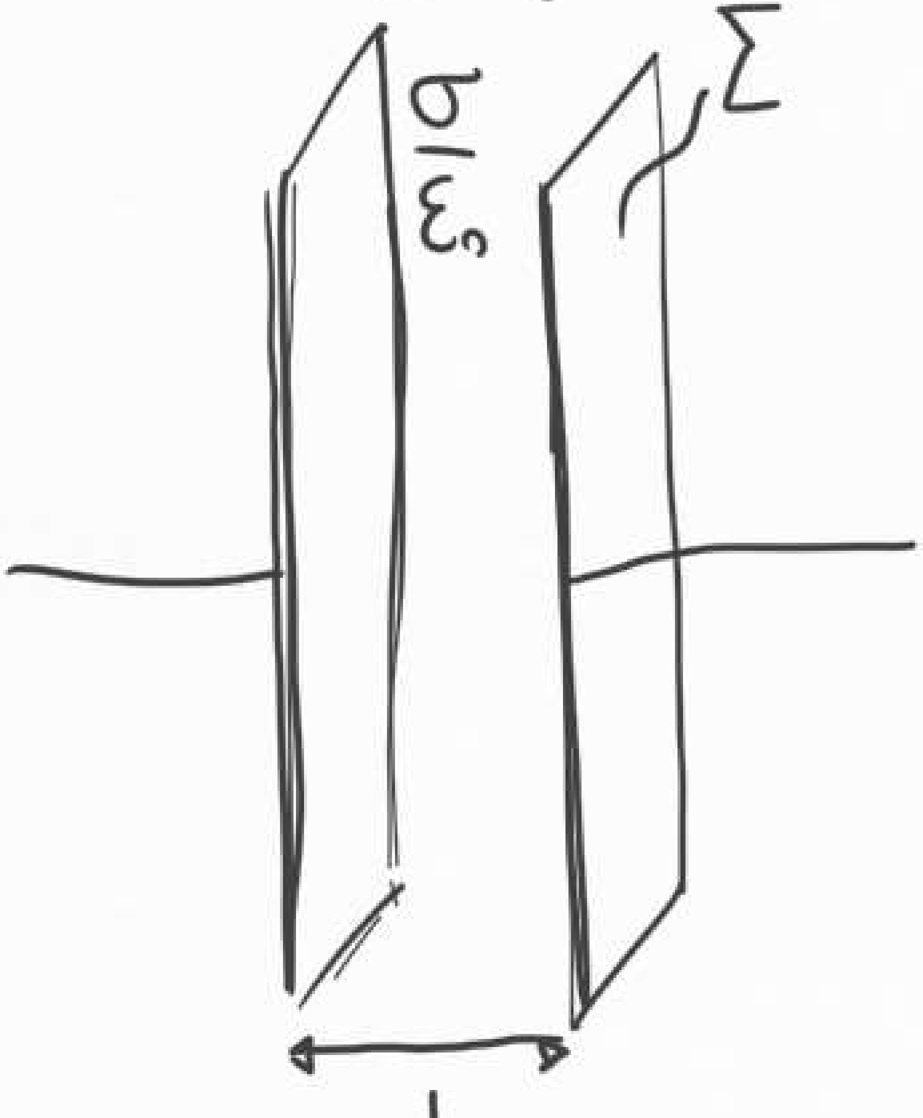
CONDENSATORI

$$\Delta V_{SG} = -\int_{R_G}^{R_S} E(r)\,dr = -\int_{R_G}^{R_S} \frac{q}{4\pi\varepsilon_0}\frac{1}{r^2}\,dr =$$

$$= \frac{q}{4\pi\varepsilon_0}\left(\frac{1}{R_S} - \frac{1}{R_G}\right) \Longrightarrow$$

$$\boxed{q = C\Delta V}\,, \quad C = \frac{4\pi\varepsilon_0}{R_G - R_S} R_G R_S \quad \text{CAPACITÀ}$$

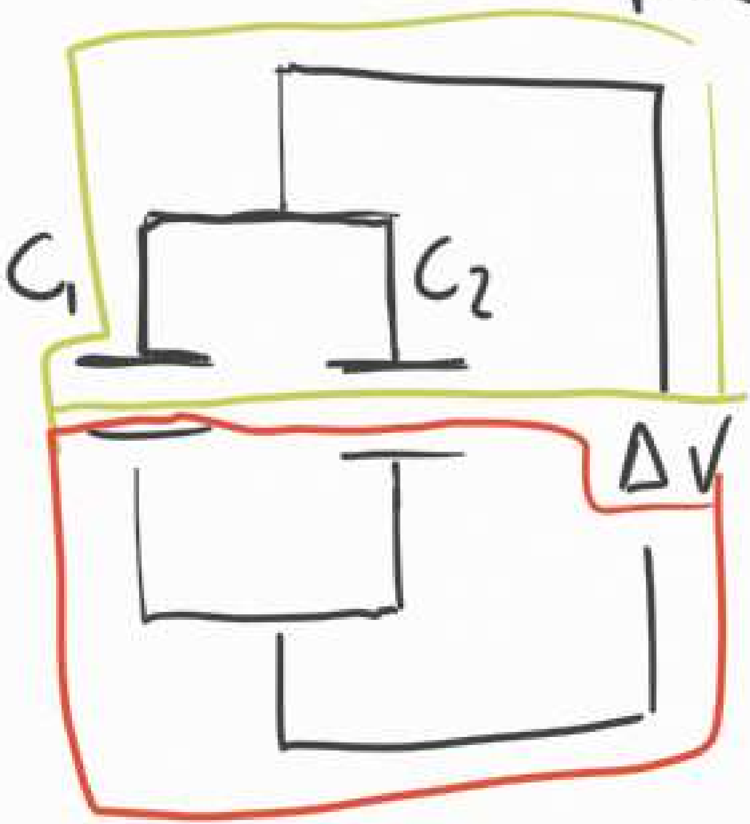
$$[C] = \frac{[q]}{[\Delta V]} = \frac{C}{V} = F$$



$$\Delta V = \frac{\sigma}{\varepsilon_0} h = \frac{q}{\Sigma \varepsilon_0} h \equiv \frac{q}{C} \Longrightarrow$$

$$\boxed{C = \frac{\Sigma \varepsilon_0}{h}}$$

PARALLELO

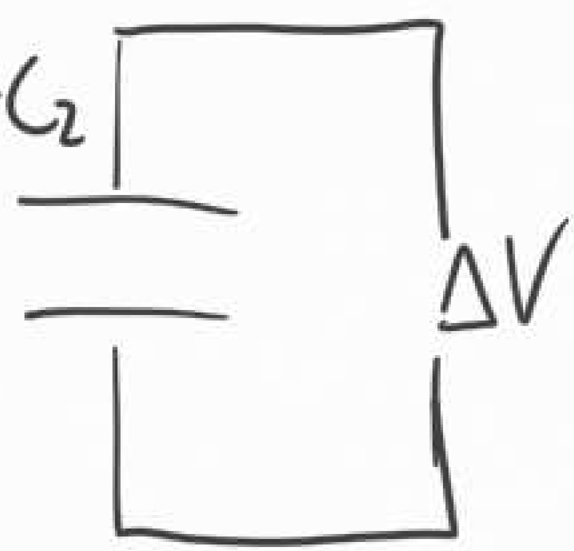


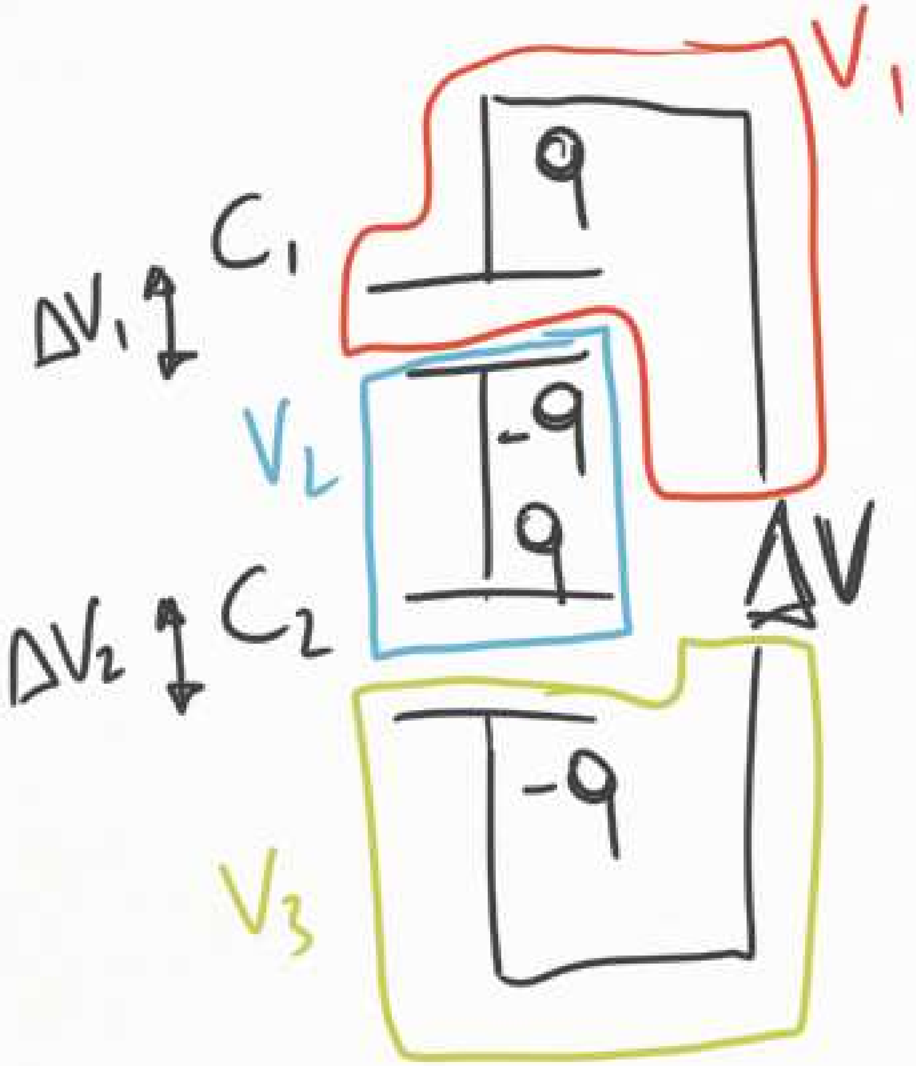
$$\begin{cases} q_1 = C_1 \Delta V \\ q_2 = C_2 \Delta V \end{cases}$$

$$q = q_1 + q_2 = (C_1 + C_2) \Delta V$$

$$\equiv$$

$C_{eq} = C_1 + C_2$





$$q = C_1 \Delta V_1$$

$$q = C_2 \Delta V_2$$

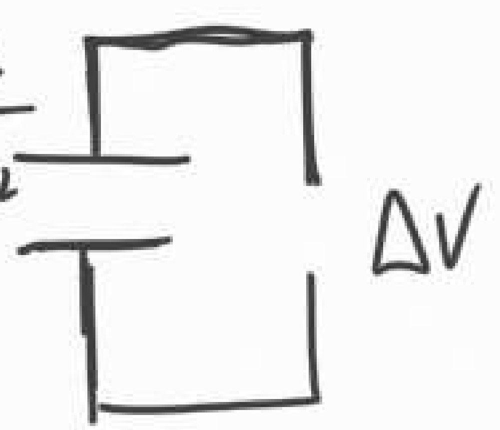
$$\Delta V = V_1 - V_3 = V_1 - V_2 + V_2 - V_3 =$$

$$= \Delta V_1 + \Delta V_2 = \frac{q}{C_1} + \frac{q}{C_2} =$$

$$= q\left(\frac{1}{C_1} + \frac{1}{C_2}\right) = \frac{q}{C_{eq}}$$

$\equiv$

$C_{eq} = \frac{C_1 C_2}{C_1 + C_2}$



$$\boxed{\frac{1}{C_{eq}} = \frac{1}{C_1} + \frac{1}{C_2}}$$