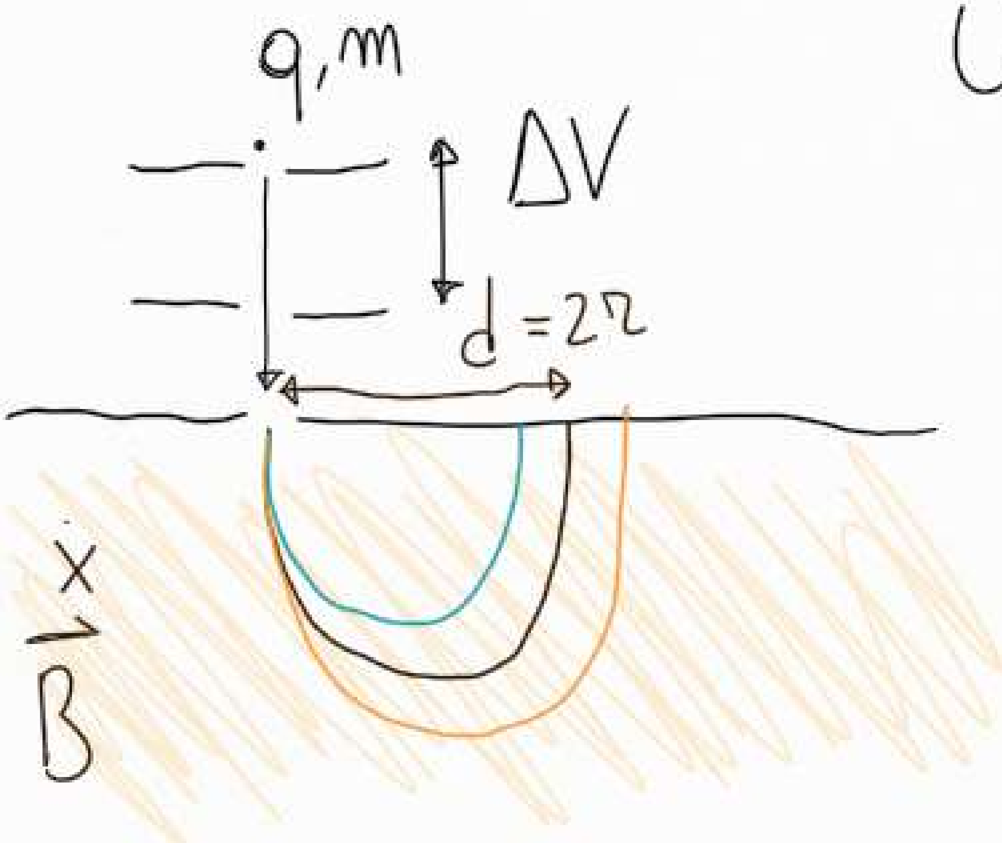
BOTTIGLIA MAGNETICA

SPECCHIO MAGNETICO

SPETTROMETRI DI MASSA

S. DI DEMPSTER

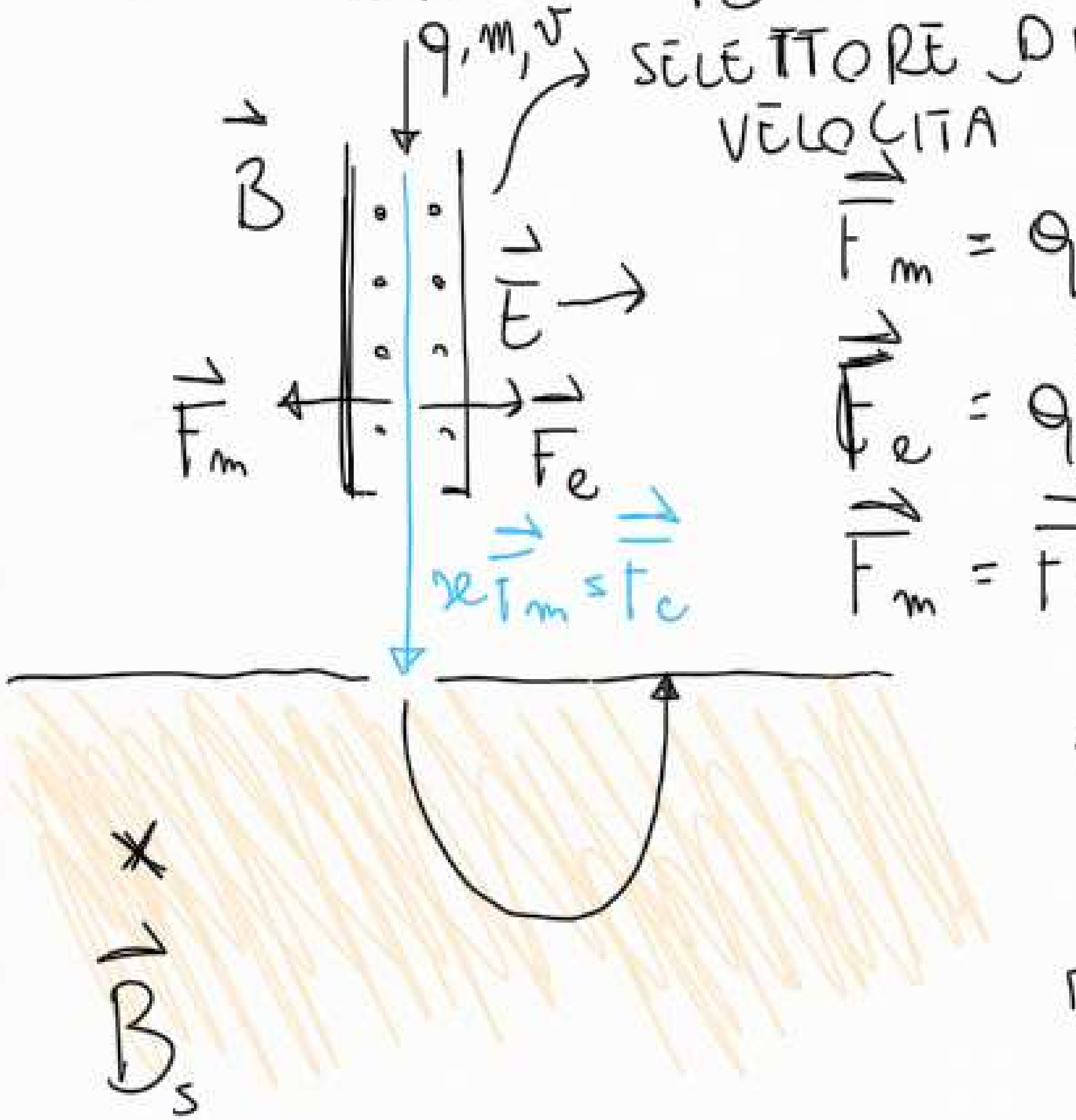


$$U_k = \frac{1}{2} m v^2 = q \Delta V \Rightarrow v = \sqrt{\frac{2 q \Delta V}{m}}$$

$$r = \frac{m v}{q B} = \sqrt{\frac{2 \Delta V m}{B^2 q}} \Rightarrow$$

$$\boxed{\frac{m}{q} = \frac{r^2 B^2}{2 \Delta V}}$$

S. DI BAINBRIDGE



$$\vec{F}_m = q\vec{v}\times\vec{B}$$

$$\vec{F}_e = q\vec{E}$$

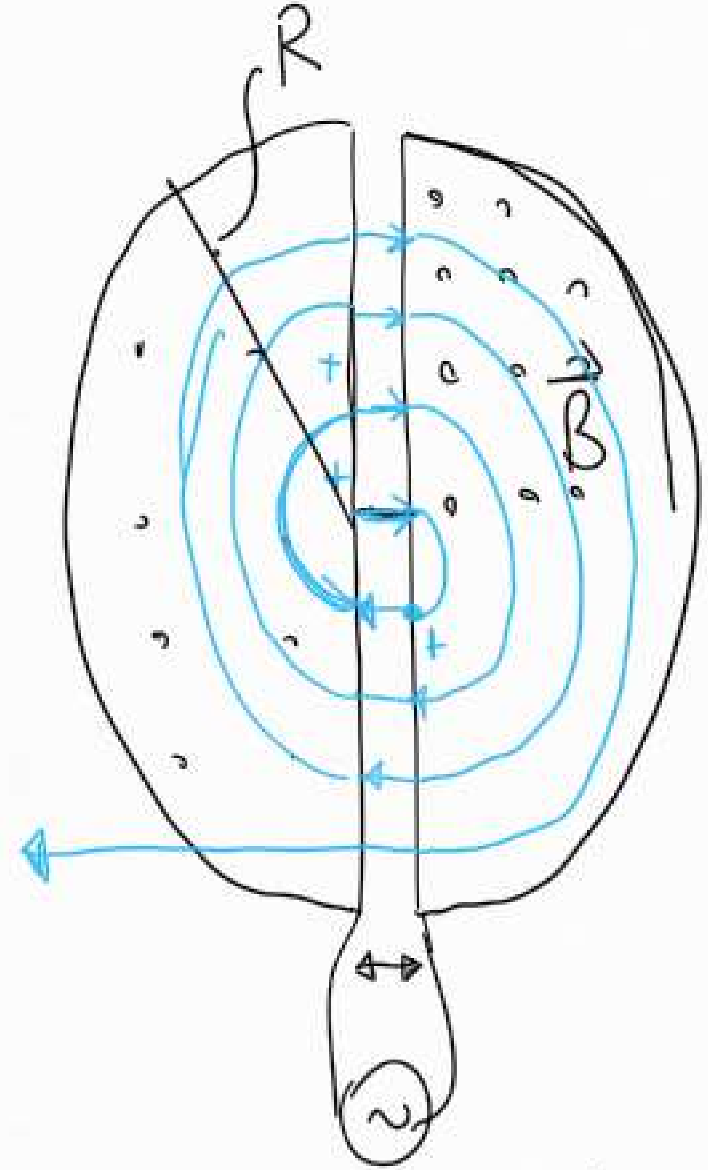
$$\vec{F}_m = \vec{F}_e \Rightarrow F_m = F_e \Rightarrow \cancel{q}vB = \cancel{q}E \Rightarrow$$

$$v = \frac{E}{B}$$

$$r = \frac{mv}{qB_s} = \frac{m}{q}\frac{E}{BB_s} \Rightarrow$$

$$\boxed{\frac{m}{q} = \frac{rBB_s}{E}}$$

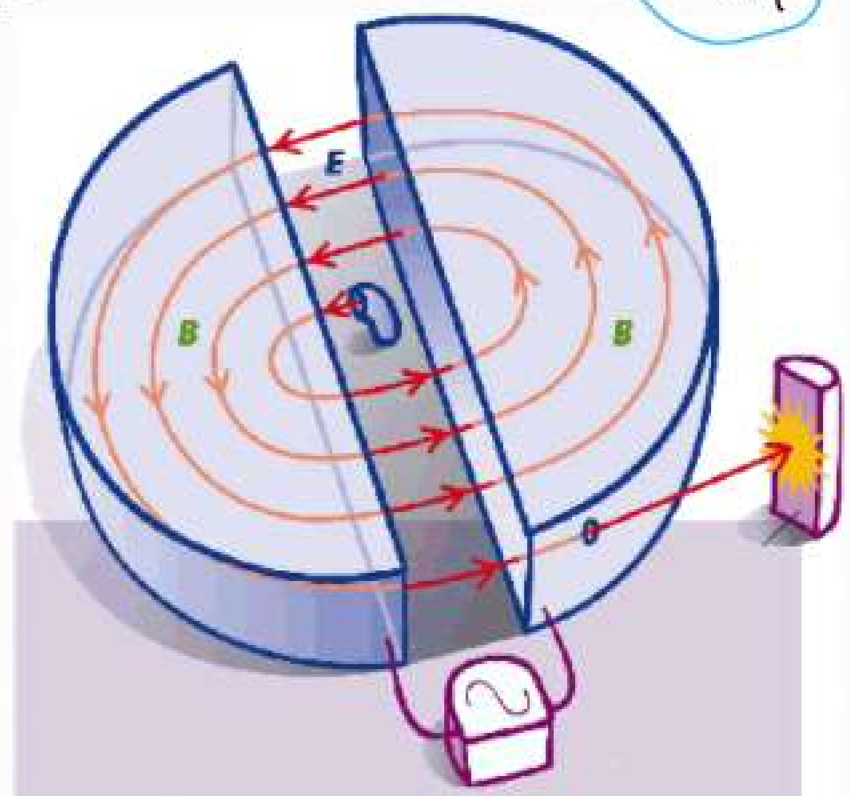
CICLOTRONE



$$T = \frac{2\pi m}{qB} \Rightarrow T_h = \frac{\pi m}{qB}$$

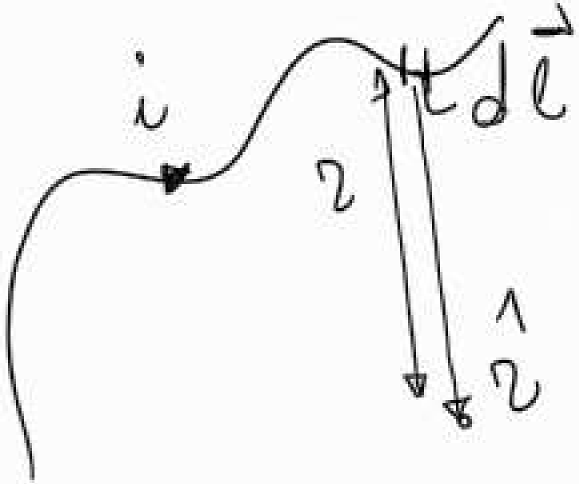
se $\omega = \frac{\pi}{T_h} \Rightarrow$

$$R = \frac{m v_M}{qB} \Rightarrow v_M = \frac{qBR}{m}$$



$$\Delta V = V_0 \sin(\omega t)$$

$$U_K = \frac{1}{2} m v_f^2 = N q \Delta V$$



$$\hat{t}\, d\vec{l} = \hat{t}\, dl$$

$$\left.\begin{array}{l} |d\vec{B}| \sim \dfrac{1}{r^2} \\ |d\vec{B}| \propto i \\ d\vec{B} \parallel d\vec{l} \times \hat{r} \end{array}\right\} d\vec{B}(\vec{r}) = K_m\, i\, \frac{d\vec{l} \times \hat{r}}{r^2}$$

$$K_m = 10^{-7}\ \frac{Tm}{A} = \frac{\mu_0}{4\pi} \Rightarrow \mu_0 = 4\pi \cdot 10^{-7}\ \frac{Tm}{A} \simeq 1.26 \cdot 10^{-6}\ \frac{Tm}{A}$$

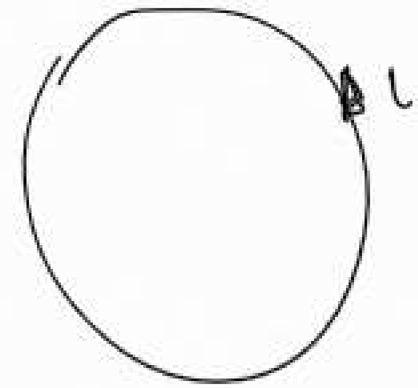
$$\Downarrow$$

I LEGGE ELEMENTARE DI LAPLACE

$$d\vec{B}(\vec{r}) = \frac{\mu_0}{4\pi}\, \frac{i\, dl}{r^2}\, \hat{t} \times \hat{r} = \frac{\mu_0}{4\pi}\, i\, \frac{d\vec{l} \times \hat{r}}{r^2}$$

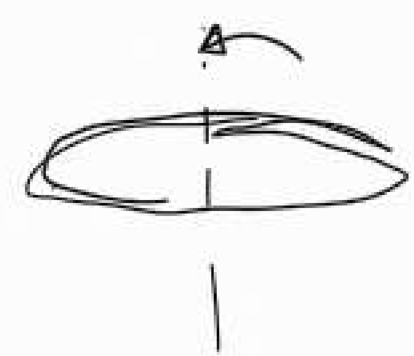
$$\vec{B} = \frac{\mu_0 i}{4\pi}\oint \frac{d\vec{l}\times\hat{r}}{r^2}$$

LEGGE DI AMPERE-LAPLACE



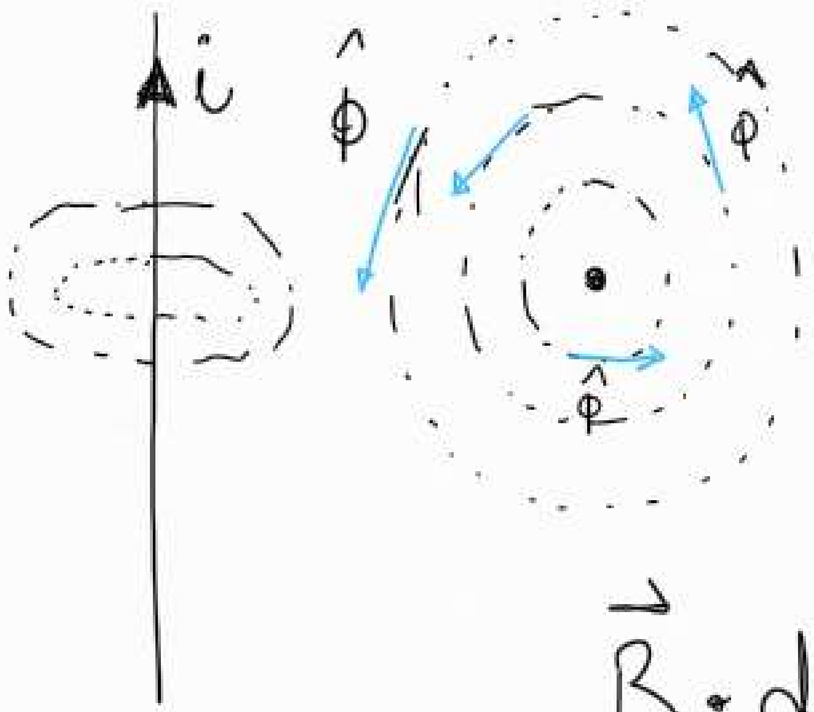
$$i = J\Sigma, \quad \vec{J} = nq\vec{v} \Rightarrow$$

$$d\vec{B} = \frac{\mu_0}{4\pi}\frac{q\vec{v}\times\hat{r}}{r^2}\underbrace{n\Sigma\, dl}_{\underbrace{n\, d\tau}_{dN_q}} = \boxed{\vec{B}}\, dN_q \Rightarrow \boxed{\vec{B} = \frac{\mu_0}{4\pi}\frac{q\vec{v}\times\hat{r}}{r^2}}$$



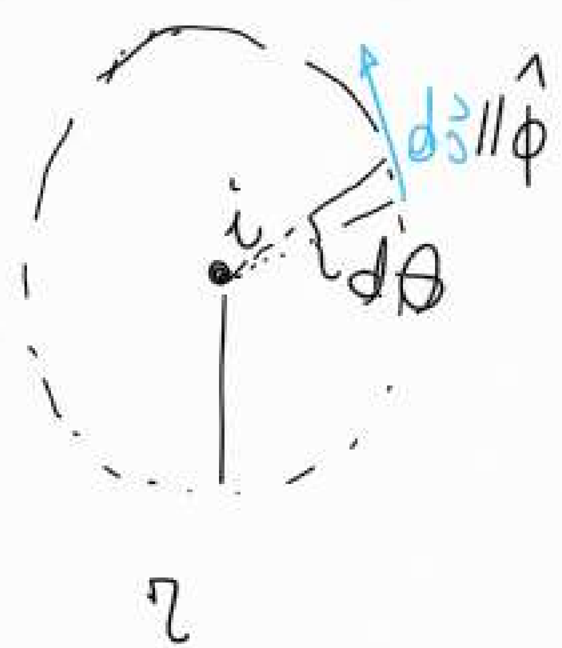
ROWLAND

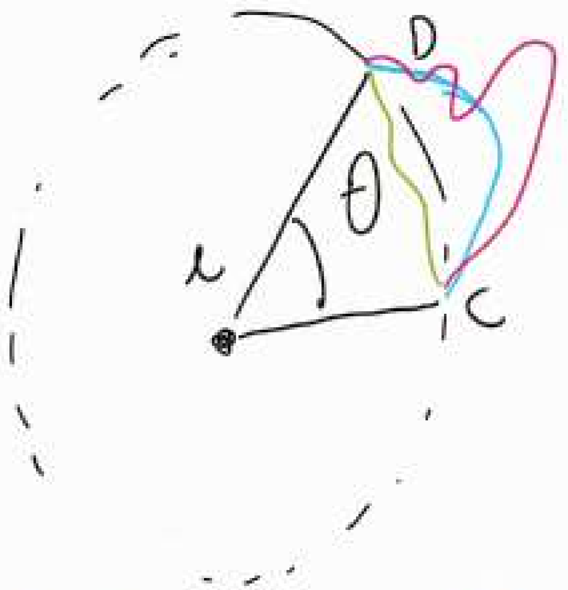
LEGGE DI AMPÈRE



$$\vec{B}(r) = \frac{\mu_0 i}{2\pi r}\hat{\phi}$$

$$\vec{B}\cdot d\vec{s} = \frac{\mu_0 i}{2\pi r} ds = \frac{\mu_0 i}{2\pi \cancel{r}} \cancel{r}\, d\theta = \frac{\mu_0 i}{2\pi} d\theta$$





$$\vec{B}\cdot d\vec{s} = \frac{\mu_0 i}{2\pi} d\theta$$

$$\int_C^D \vec{B}\cdot d\vec{s} = \int_C^D \frac{\mu_0 i}{2\pi} d\theta = \frac{\mu_0 i}{2\pi}\theta$$

$$d\vec{s} = d\vec{s}_p + d\vec{s}_o \Rightarrow \vec{B}\cdot d\vec{s} = \vec{B}\cdot d\vec{s}_p + \cancel{\vec{B}\cdot d\vec{s}_o} = B\, ds_p = \frac{\mu_0 i}{2\pi} d\theta \Rightarrow$$

$$\int_C^D \vec{B}\cdot d\vec{s} = \frac{\mu_0 i}{2\pi}\theta = \int_C^D \vec{B}\cdot d\vec{s} = \int_C^D \vec{B}\cdot d\vec{s}$$

$$\int_D^C \vec{B}\cdot d\vec{s} = -\frac{\mu_0 i}{2\pi}\theta$$

$$\oint_p \vec{B}\cdot d\vec{s} = \int_C^D \vec{B}\cdot d\vec{s} + \int_D^C \vec{B}\cdot d\vec{s} = \frac{\mu_0}{2\pi} i\theta - \frac{\mu_0}{2\pi} i\theta = 0$$

$$\boxed{\oint_p \vec{B}\cdot d\vec{s} = \frac{\mu_0 i}{2\pi} 2\pi = \mu_0 i} \neq 0$$

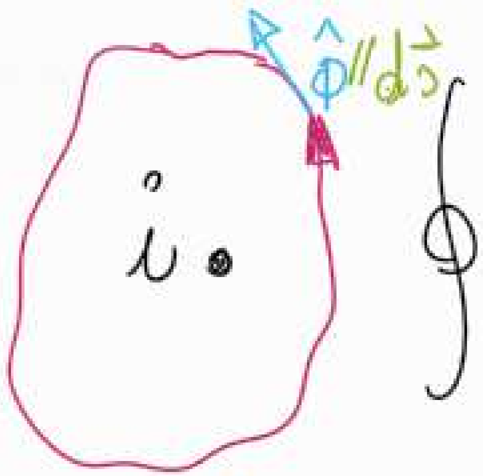
CONCATENA i

$$\vec{B} = \vec{B}_1 + \vec{B}_2 + \vec{B}_3$$

$$\boxed{\oint_p \vec{B}\cdot d\vec{s} = \mu_0 \sum_k i_k}$$

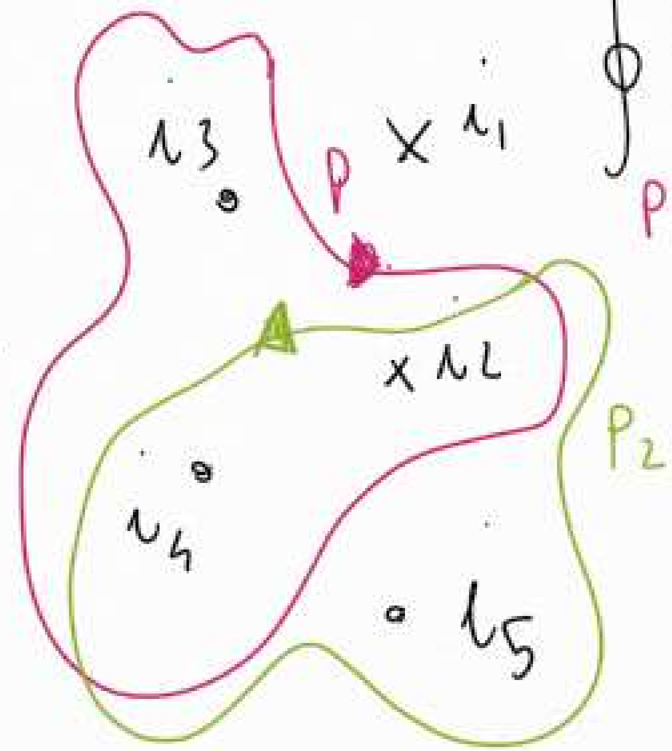
TEOREMA DI AMPÈRE

$$\oint_p \vec{B}\cdot d\vec{s} = \oint_p \vec{B}_1\cdot d\vec{s} + \cancel{\oint_p \vec{B}_2\cdot d\vec{s}} + \oint_p \vec{B}_3\cdot d\vec{s}$$



$$\oint \vec{B}\cdot d\vec{s} = \mu_0 i$$

$$\oint \vec{B}\cdot d\vec{s} = -\mu_0 i$$



$$\oint_P \vec{B}\cdot d\vec{s} = \mu_0 (i_2 - i_3 - i_4)$$

$$\oint_{P_2} \vec{B}\cdot d\vec{s} = \mu_0 (i_4 + i_5 - i_2)$$