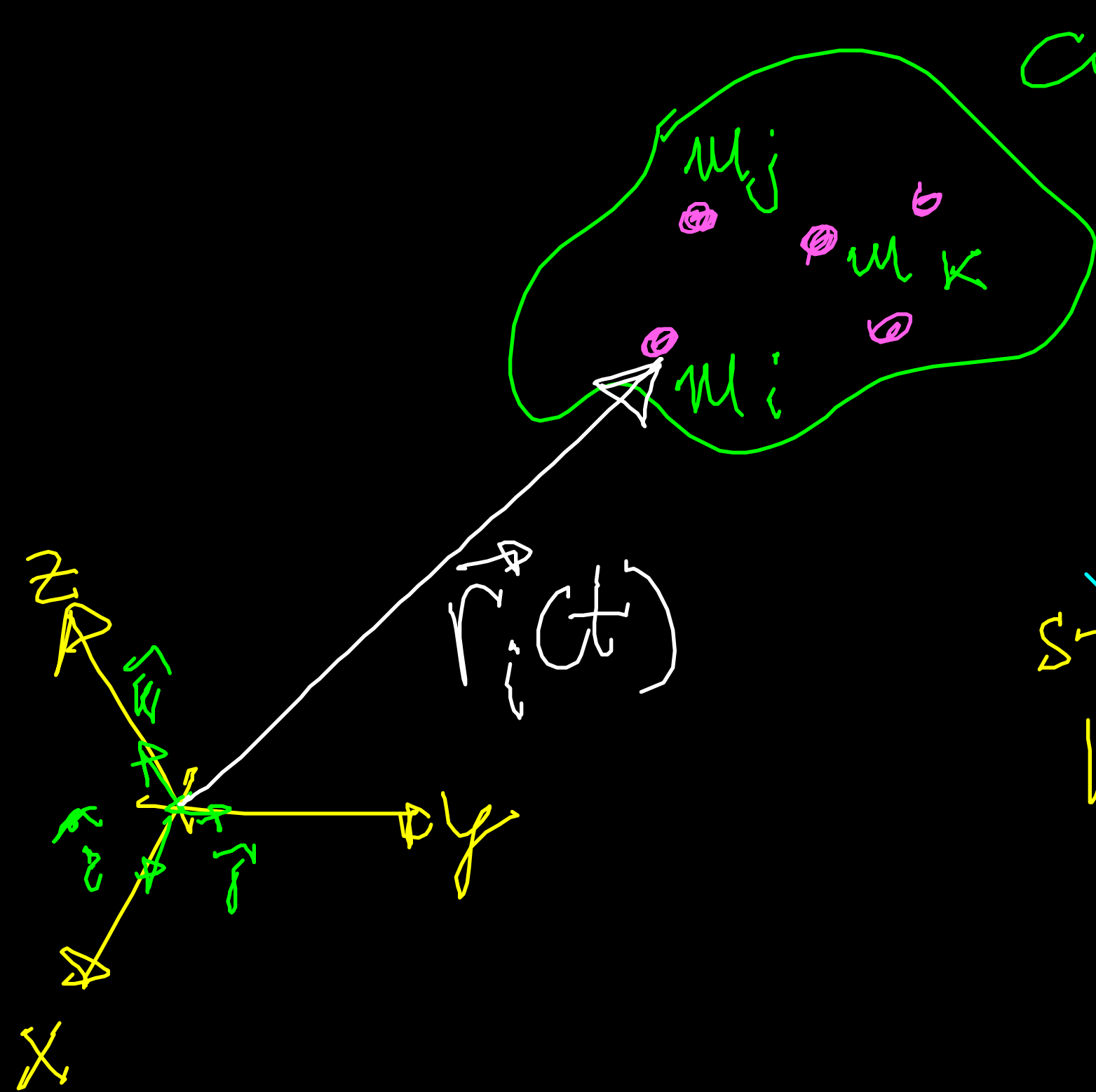


MOTO DEI SISTEMI



CORPO
ESTESO

$i = 1, \dots, N$ CORPUSCOLI

$N \approx N_A = 6,023 \times 10^{23}$

~~STUDIO DEL MOTO
INDIVIDUALE DEGLI~~

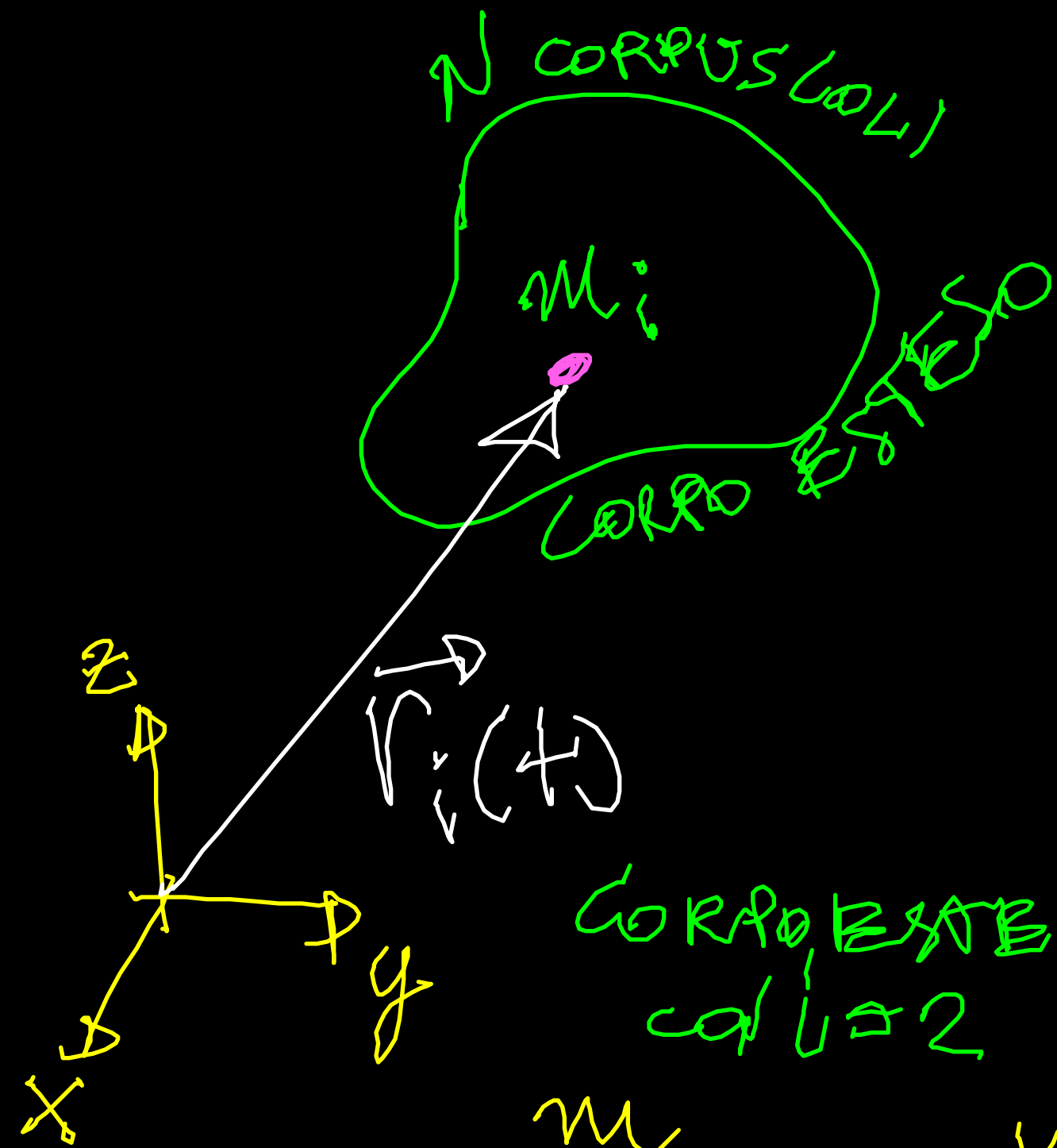
~~$m_i \Rightarrow 6 \cdot N_A$ VARIABILI~~

CENTRO
DI MASSA

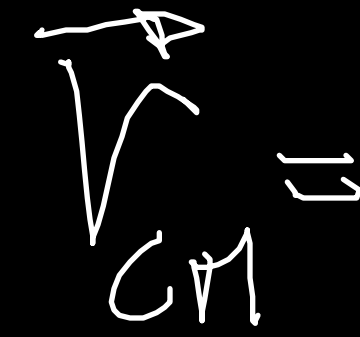
PROPRIETA' MEDIE

↓
RIDURRE IL NUM. DELLE
VARIABILI

CENTRO DI MASSA

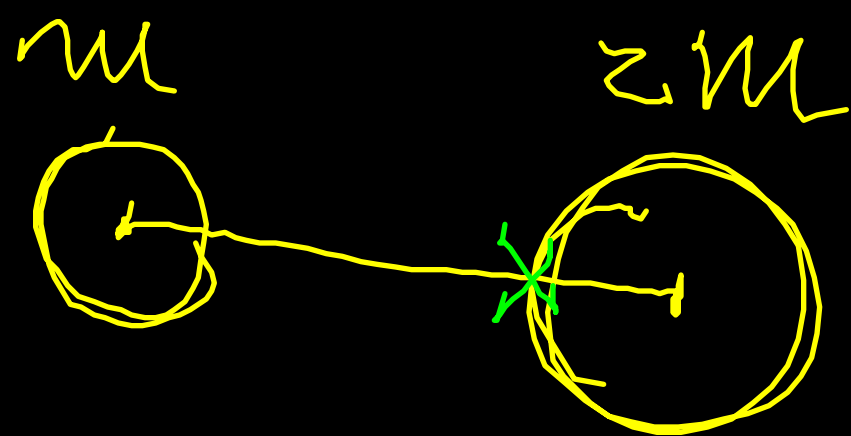
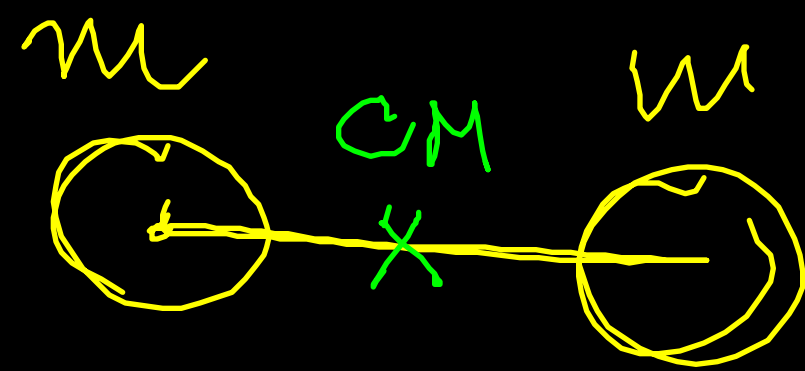


VECTORE
POSIZIONE
DEL "CENTRO
DI MASSA"

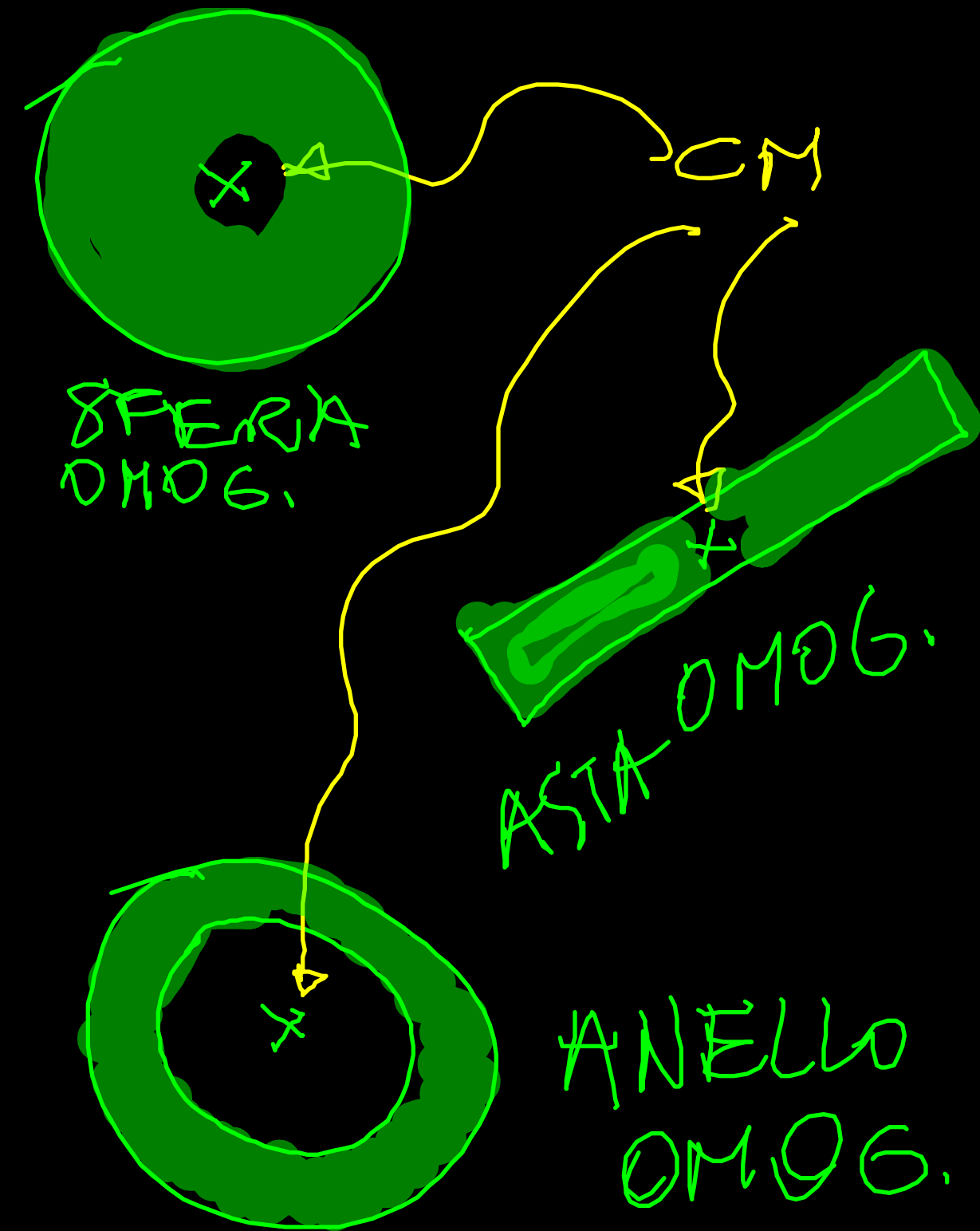


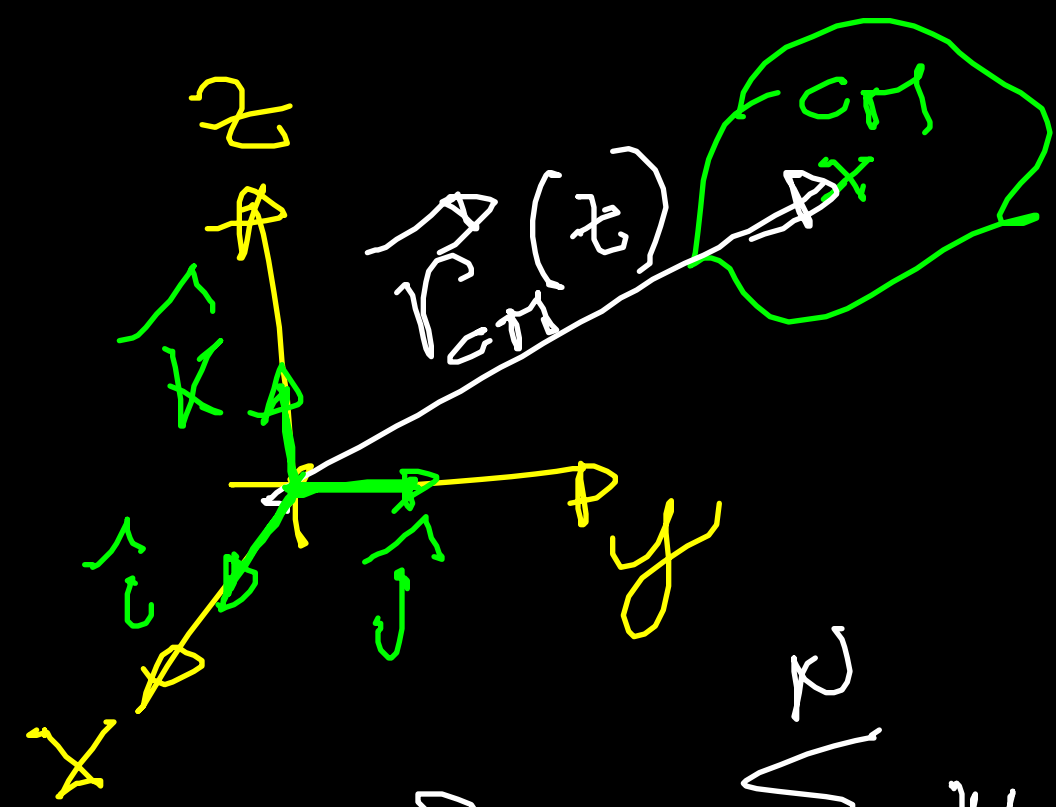
$$\vec{r}_{CM} = \frac{\sum_{i=1}^N m_i \vec{r}_i(t)}{\sum_{i=1}^N m_i}$$

CORPO ESTESO
con $U=2$



ESEMPLI
DI CORPI
OMOG.
DI FORMA
REGOLARE





CORPO CON
ELEM.
DISCRETI

$$\vec{r}_{CM} = \frac{\sum_{i=1}^N m_i \vec{r}_i}{\sum_{i=1}^N m_i} = \frac{\sum_{i=1}^N m_i \vec{r}_i}{M}$$

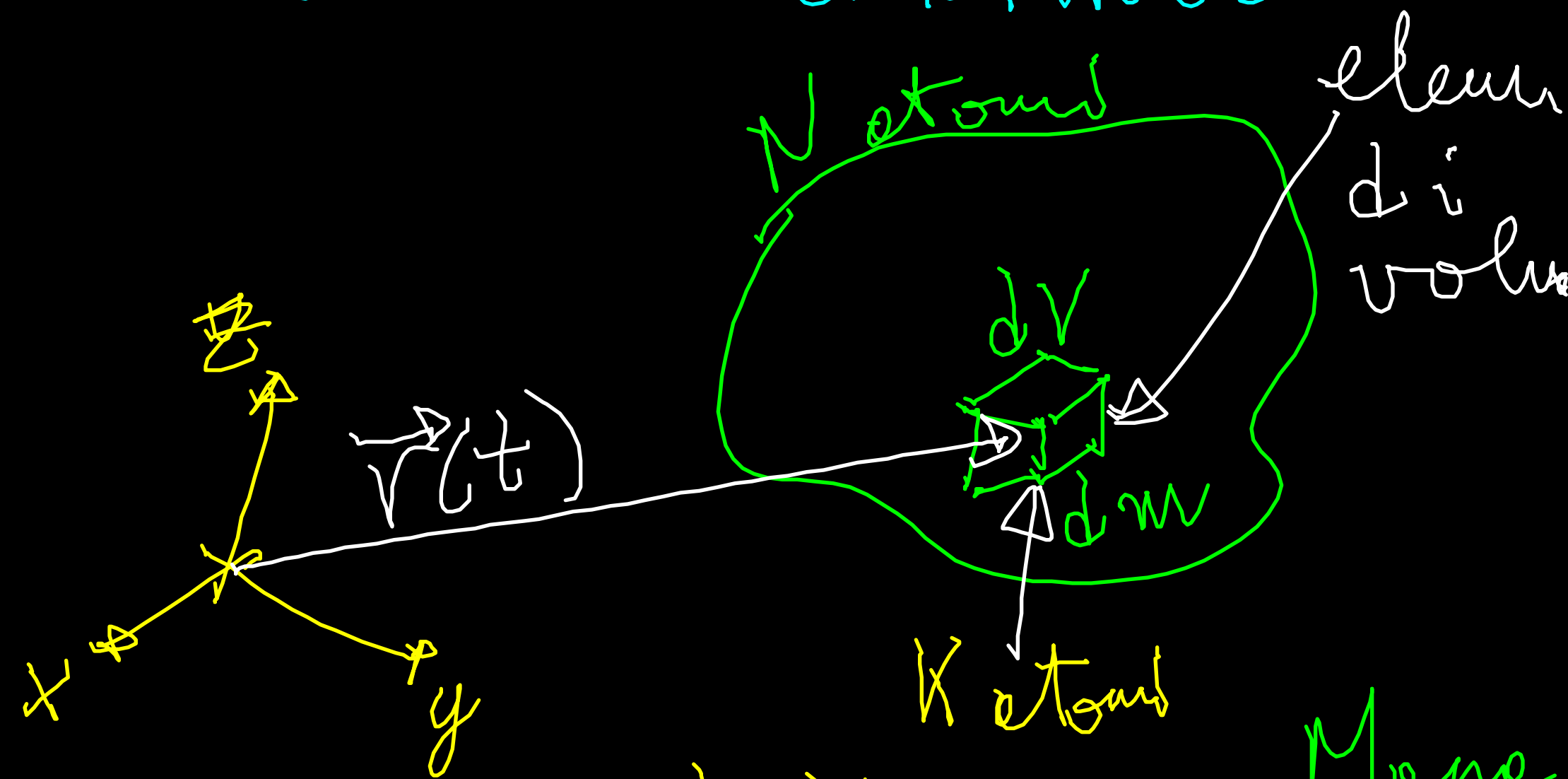
MASSA TOT.
DEL CORPO

$$\vec{r}_{CM} \cdot \hat{x} = x_{CM} = \frac{\sum_{i=1}^N m_i x_i}{M}$$

$$\vec{r}_{CM} \cdot \hat{y} = y_{CM} = \frac{\sum_{i=1}^N m_i y_i}{M}$$

$$\vec{r}_{CM} \cdot \hat{z} = z_{CM} = \frac{\sum_{i=1}^N m_i z_i}{M}$$

CORPO "CONTINUO"

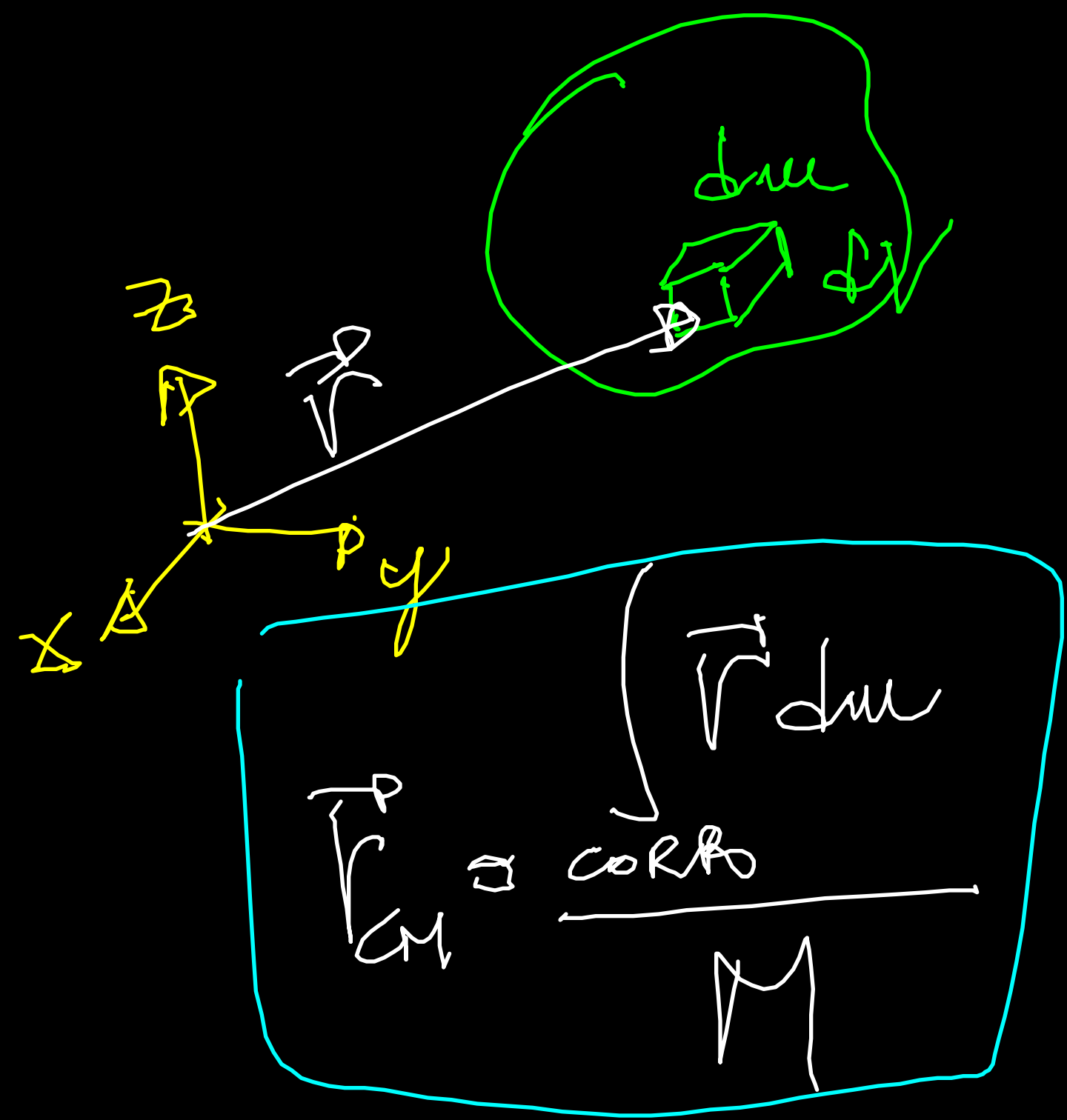


$K \ll N$
 $K \cdot \bar{v} \gg 1$
 $m \ll M$

Mass
 Tot
 M

$$\vec{r}_{CM} = \frac{\int_{CORPO} \vec{r} dm}{\int_{CORPO} dm} = \frac{\int_{CORPO} \vec{r} dm}{M}$$

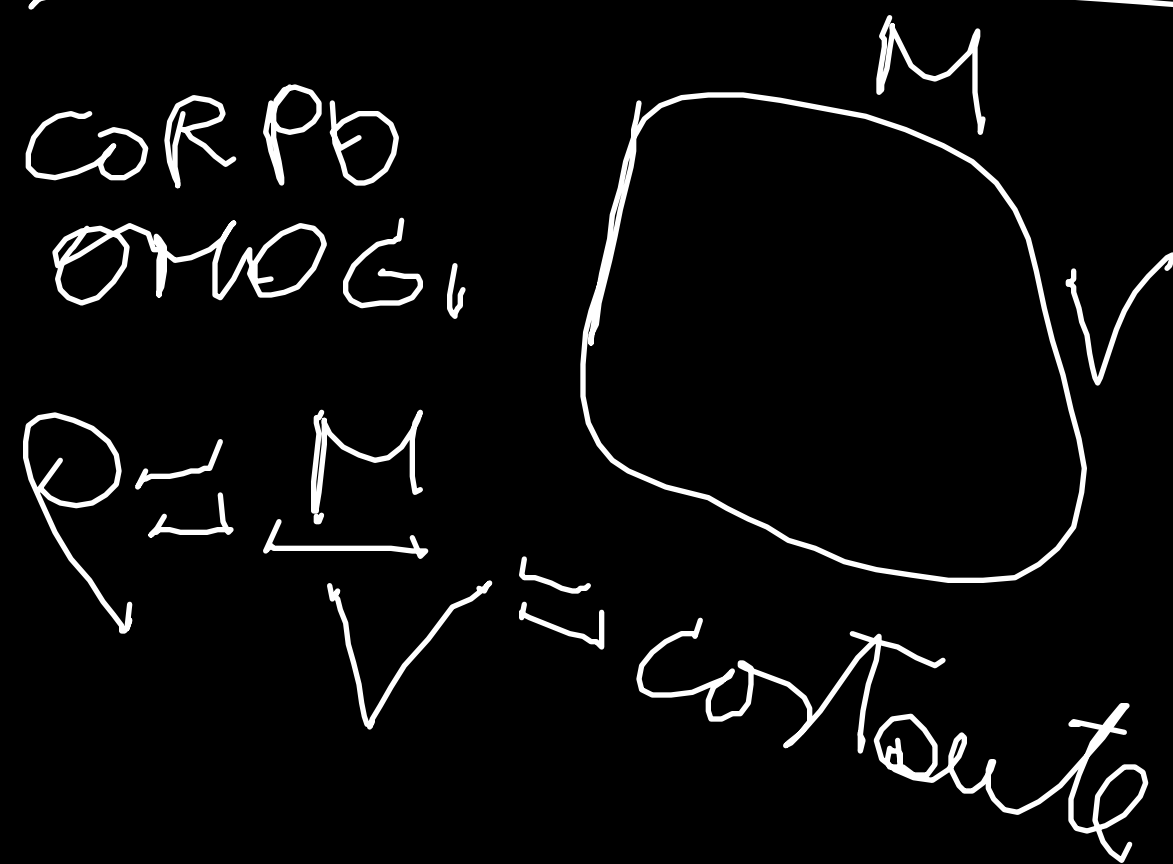
$\int_{CORPO} dm$
 M
 massa totale



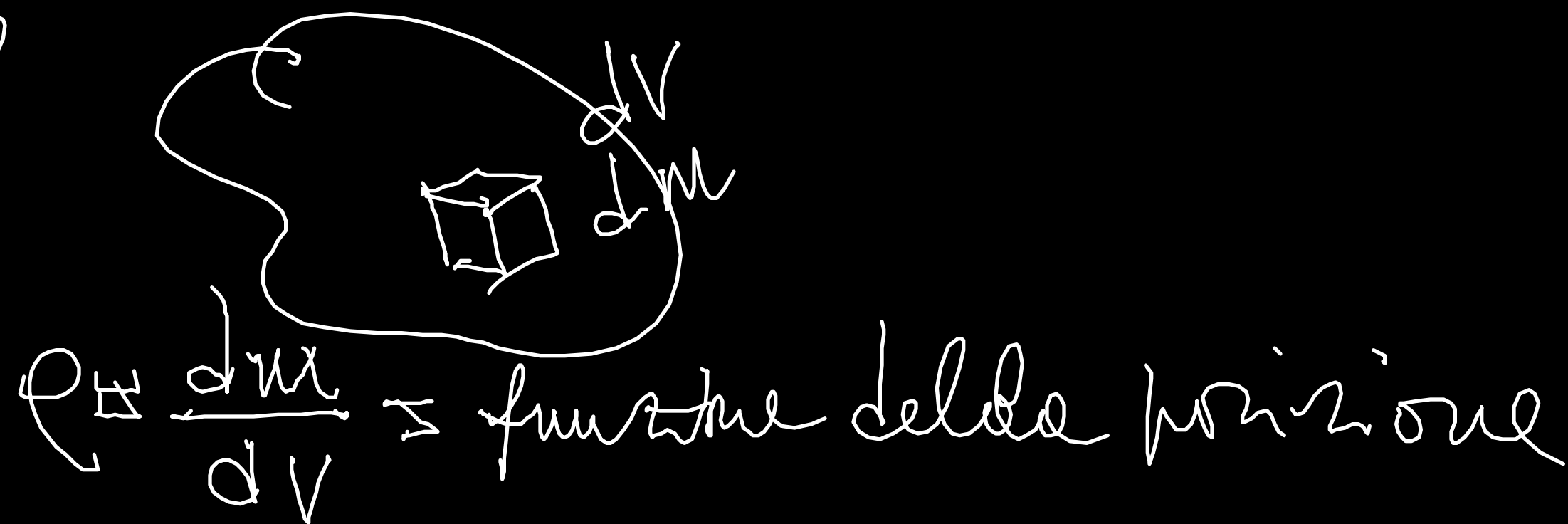
$$dm = \rho(\vec{r}) dV$$

$$= \frac{\int_{CORPO} \vec{r} \rho(\vec{r}) dV}{\int_{CORPO} dm} = \frac{\int_{VOL.} \vec{r} \rho(\vec{r}) dV}{\int_{VOL} \rho(\vec{r}) dV}$$

DENSITA' (massa/vol)

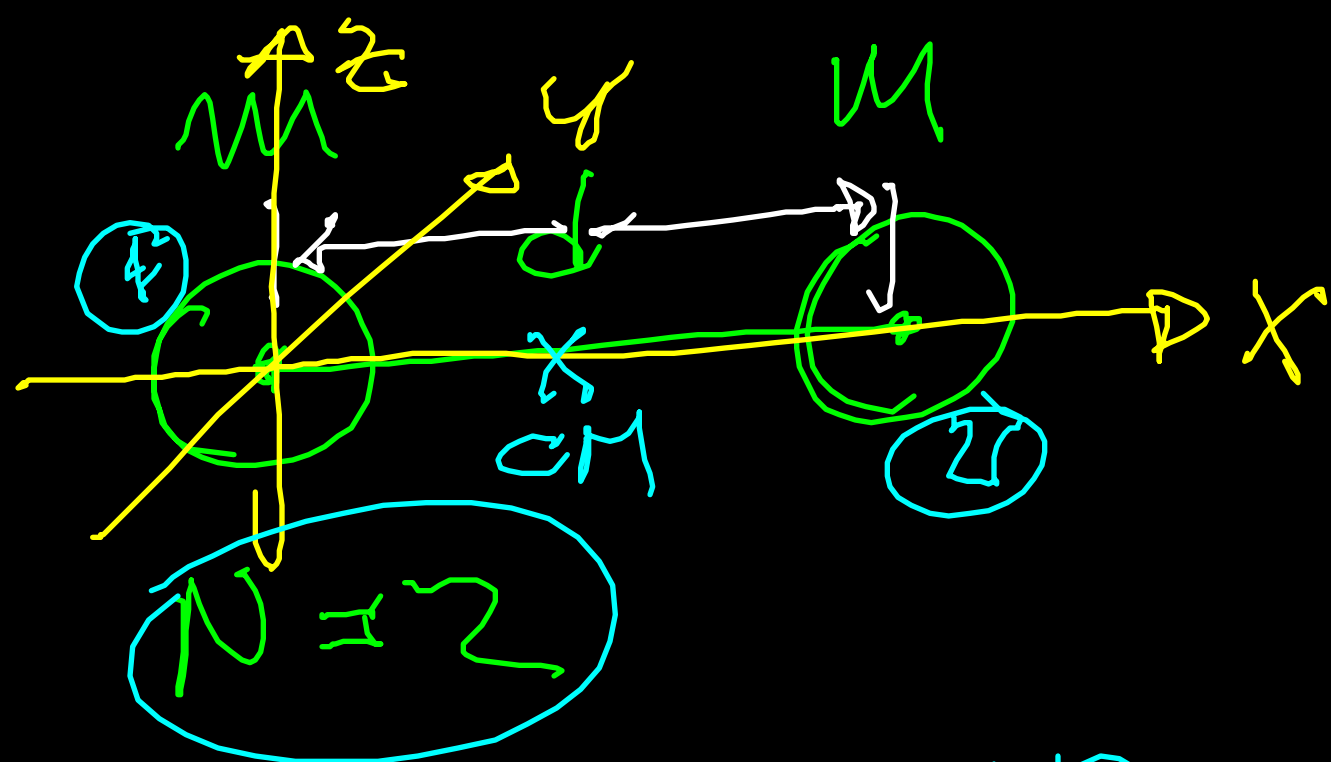


CORPO
NON
OMOGENEO



ESEMPIO

MANUBRIO
RIGIDO
di cui



$$z_{CM} \approx 0; \quad y_{CM} \approx 0$$

$$X_{CM} = \frac{\sum_{i=1}^N m_i X_i}{\sum_i m_i} =$$

$$= \frac{m_1 X_1 + m_2 X_2}{m_1 + m_2} = \frac{m d}{2m} \approx \frac{d}{2}$$

