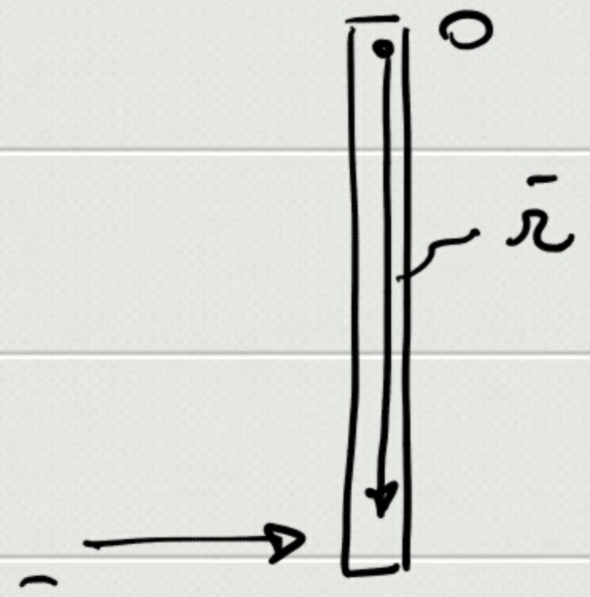
$$\bar{F} = \frac{d\bar{p}}{dt}$$

$$\bar{J} = \int \bar{F}\,dt = \int d\bar{p} = \Delta\bar{p}$$

$$\bar{M}_o = \frac{d\bar{L}_o}{dt}$$

$$\int_{t_o}^{t} \bar{M}_o^{\varepsilon}\,dt = \int_{\bar{L}_o(t_o)}^{\bar{L}_o(t)} d\bar{L}_o = \bar{L}_o(t) - \bar{L}_o(t_o) = \Delta\bar{L}$$

Teorema del impulso del momento (impulso angolare)



$$\bar{M}_o = \bar{r} \times \bar{F}$$

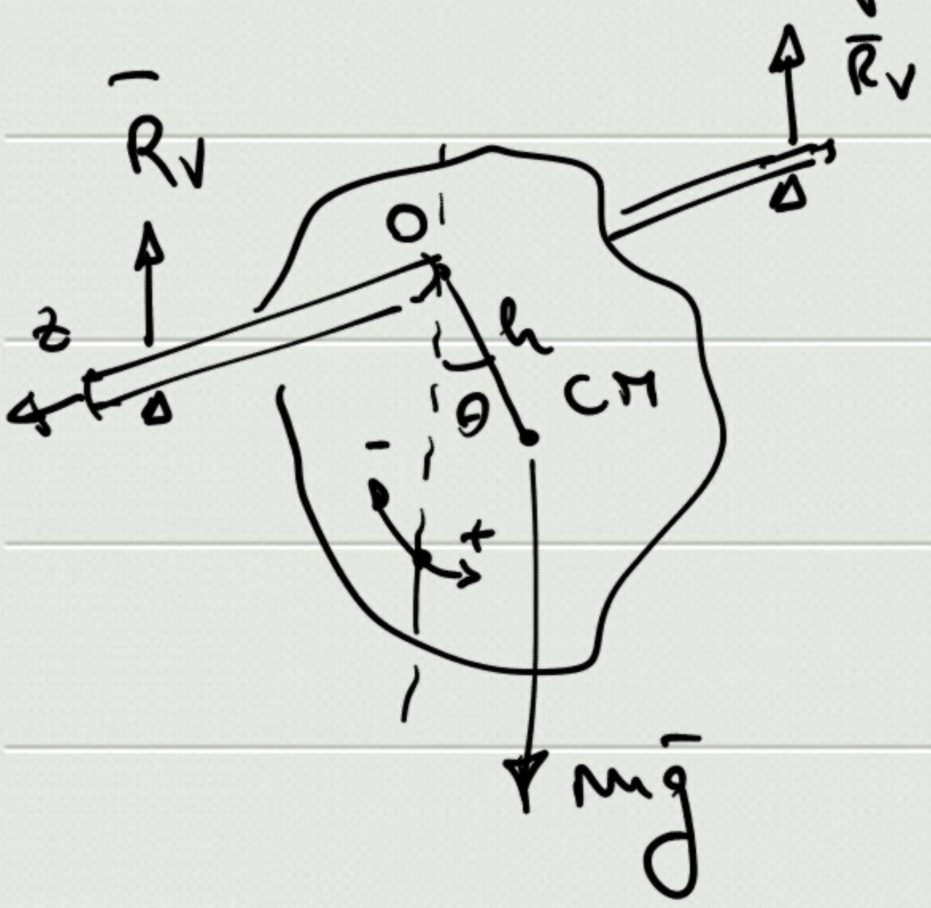
$\bar{r} \simeq cost$

$$\int \bar{M}_o\,dt = \int \bar{r} \times \bar{F}\,dt = \bar{r} \times \int \bar{F}\,dt = \bar{r} \times \bar{J}$$

Impulso del momento = momento dell'impulso

Teorema del momento dell'impulso

Pendolo composto



$$\bar{M}^{\varepsilon}_{O} = I_z \bar{\alpha}$$

$$\bar{M}_{O,peso} = \bar{h} \times m\bar{g}$$

$$\stackrel{!}{=} h\, mg \sin\theta \,(-\bar{u}_z)$$

$$-mgh\sin\theta = I_z \alpha$$

piccole oscillazioni

$$\Rightarrow \quad -mgh\theta = I_z \frac{d^2\theta}{dt^2}$$

$$\Rightarrow \quad \frac{d^2\theta}{dt^2} + \frac{mgh}{I_z}\theta = 0 \qquad \Omega = \sqrt{\frac{mgh}{I_z}}$$

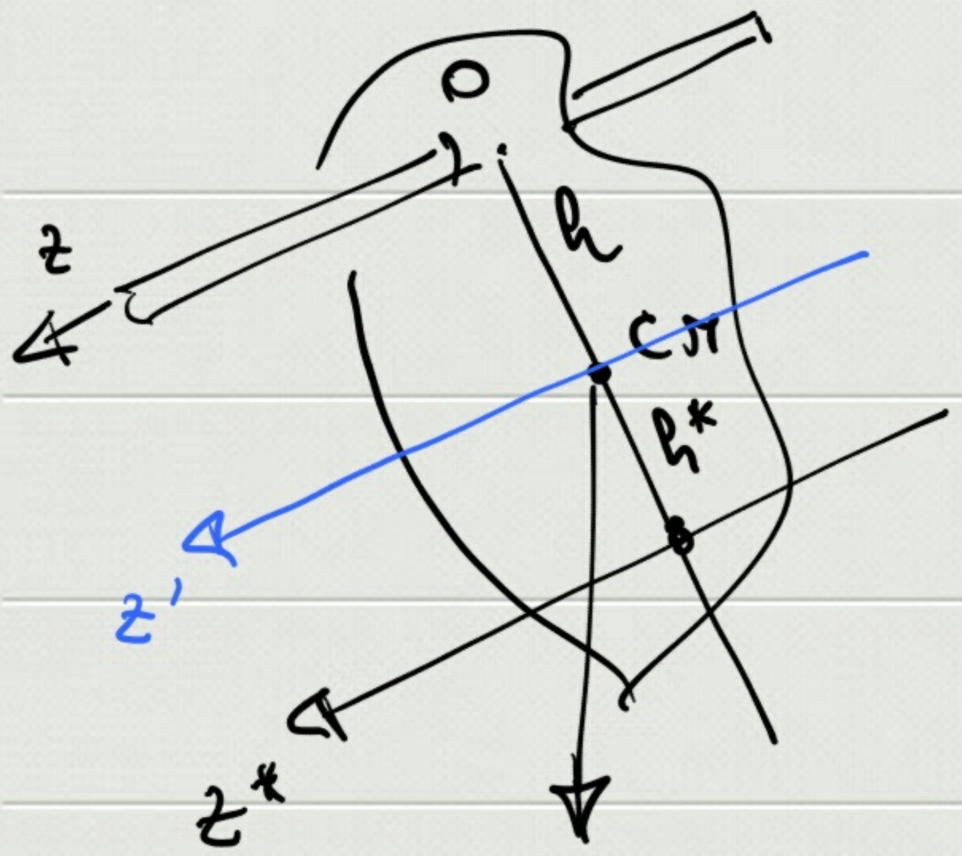
$$\Rightarrow \boxed{\theta(t) = \theta_0 \sin(\Omega t + \phi)}$$

$$T = \frac{2\pi}{\Omega} = 2\pi\sqrt{\frac{I_z}{mgh}} \qquad T = 2\pi\sqrt{\frac{l}{g}}$$

$$\boxed{l = \frac{I_z}{mh}}$$ lunghezza ridotta

H-S

$$l = \frac{I_z}{mh} \overset{!}{=} \frac{I_{z'} + mh^2}{mh} =$$



$$= \frac{I_{z'}}{mh} + h = h^* + h$$

$$\Rightarrow \boxed{I_{z'} = mhh^*}$$

$m\bar{g}$ $\Rightarrow l^* = \frac{I_{z^*}}{mh^*}$

$$l^* = \frac{I_{z^*}}{mh^*} = \frac{I_{z'} + mh^{*2}}{mh^*} = \frac{I_{z'}}{mh^*} + h^* = h + h^*$$

z e z^* → assi reciproci