

# Class XI, Rotational Motion

Tuesday, November 16, 2021

## Conservation of Angular Momentum:

$$\frac{d\vec{L}}{dt} = \vec{\tau} \quad \text{--- (1)}$$

If  $\vec{\tau} = 0$ , by (1)  $\frac{d\vec{L}}{dt} = 0 \Rightarrow d\vec{L} = 0$

or  $\vec{L}_f - \vec{L}_i = 0 \Rightarrow$

$$\boxed{\vec{L}_f = \vec{L}_i}$$

$\therefore \checkmark L = I\omega \Rightarrow$

$I_f < I_i$

$$\boxed{I_f \omega_f = I_i \omega_i}$$

$$\frac{I_f}{I_i} = \frac{\omega_i}{\omega_f}$$

$$\therefore I_f < I_i \Rightarrow \frac{\omega_i}{\omega_f} < 1 \Rightarrow \underline{\underline{\omega_f > \omega_i}}$$

$\checkmark \Rightarrow$  If  $\vec{\tau} = 0$  then  $\boxed{L_f = L_i}$  or  $\boxed{I_f \omega_f = I_i \omega_i}$

$$\rightarrow I_2 \omega_2 = I_1 \omega_1$$