## Rotational Dynamics

$$J\dot{ec{\omega}} = ec{\omega} imes (Jec{\omega}) + ec{ au}_{ extit{dist}} + ec{ au}_{ extit{act}}$$

## Rotational Kinematics. Quaternions

$$\begin{split} q &= [\ \eta, \vec{\epsilon}\ ] \\ \dot{\vec{\eta}} &= \frac{1}{2} \vec{\epsilon} \cdot \omega_{ob}^b \\ \dot{\vec{\epsilon}} &= \frac{1}{2} \left( \eta + Sq(\ \vec{\epsilon}\ ) \right) \vec{\omega}_{ob}^b \end{split}$$

## The Magnetorquer problem

$$\vec{\tau} = \vec{m} \times \vec{\beta} \tag{1}$$