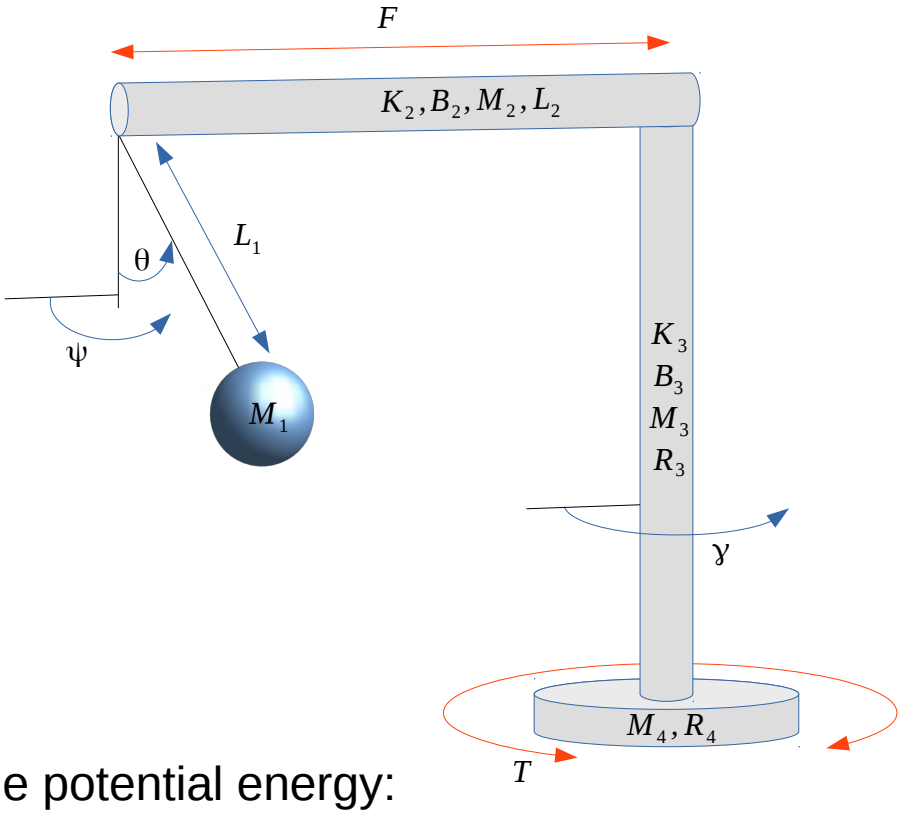

Langrage potential energy:

$$V = m g L_1 \sin\theta$$

Langrage kinect energy:

$$T = \frac{1}{2}\left(\frac{1}{2} M_4 R_4^2\right)\dot{\gamma}^2 + \frac{1}{2}\left(\frac{1}{2} M_3 R_3^2\right)\dot{\gamma}^2 + \frac{1}{2}\left(\frac{1}{3} M_2 L_2^2\right)\dot{\gamma}^2 + \frac{1}{2} M_1 \left(L_2 + m g L_1 \sin\theta \cos\psi\right)^2 \dot{\gamma}^2$$