The derivation of the steady state equation by Bengt-Olof Drugge 070522

Constant momentum

$$m \cdot v_1 \cdot R = m \cdot v_2 \cdot R_o$$

T = Rotation time of the object
Ro = Radii of the object
mo= mass of the object

$$\omega \cdot R^2 = \frac{2 \cdot \pi \cdot \left(R_o\right)^2}{T}$$

$$\omega = \frac{2 \cdot \pi \cdot \left(R_o\right)^2}{T \cdot R^2}$$

Cetripethalforce

$$F = m \cdot \omega^2 \cdot R$$

$$F = \frac{m \cdot 4 \cdot \pi^2 \cdot \left(R_o\right)^4}{T^2 \cdot R^3}$$

Gravitylaw

$$F = \frac{G \cdot m \cdot m_o}{R^2}$$

The steady state equation

$$F(R) = \frac{m \cdot 4 \cdot \pi^2 \cdot \left(R_o\right)^4}{T^2 \cdot R^3} - \frac{G \cdot m \cdot m_o}{R^2}$$

$$R_{ss} = \frac{4 \cdot \pi^2 \cdot \left(R_o\right)^4}{G \cdot m_o \cdot T^2}$$

The Steady State Radii