

7 Al 5-lea satelit al lui Jupiter

$$T_s = 0,4982 \text{ zile} \quad a_s = 0,001207 \text{ u.a.}$$

$$\text{Jupiter: } T_J = 11,86 \text{ ani} \quad a_J = 5,203 \text{ u.a.}$$

Raportul dintre masa planetei Jupiter și masa Soarelui

$$\frac{T_J^2}{a_J^3} = \frac{4\pi^2}{GM_\odot} \quad M_\odot \text{ masa soarelui}$$

$$G = 6.668 \cdot 10^{-11} \text{ N} \cdot \text{m}^2/\text{kg}^2$$

$$\frac{T_s^2}{a_s^3} = \frac{4\pi^2}{G m_J}$$

$$\left. \begin{aligned} 4\pi^2 &= \frac{T_J^2 \cdot G \cdot M_\odot}{a_J^3} \\ 4\pi^2 &= \frac{T_s^2 \cdot G \cdot m_J}{a_s^3} \end{aligned} \right\} \Rightarrow \frac{T_J^2 \cdot G \cdot M_\odot}{a_J^3} = \frac{T_s^2 \cdot G \cdot m_J}{a_s^3}$$

$$\frac{M_\odot}{m_J} = \frac{T_s^2 \cdot a_J^3}{T_J^2 \cdot a_s^3} = \frac{T_s^2 \cdot 140,85}{T_J^2 \cdot 17 \cdot 10^{-10}} = \frac{0,4982 \cdot 140,85}{17 \cdot 10^{-10}}$$

$$\begin{aligned} T_J &= 4331,77 \text{ zile} \\ &= \frac{0,2482 \cdot 140,85}{18764231,33 \cdot 17 \cdot 10^{-10}} = \frac{34,95}{318991932,65 \cdot 10^{-10}} = \\ &= \frac{34,95}{0,031} = 1127,41 \end{aligned}$$