

The Moon's Trajectory

Robert I. Price

Osher Lifelong Learning Institute

A Splash Page

The Orbit(s) of

How many moons?

$$F_{E,M} = (1.770 \leftrightarrow 2.305) \times 10^{20} \text{ Nt}$$

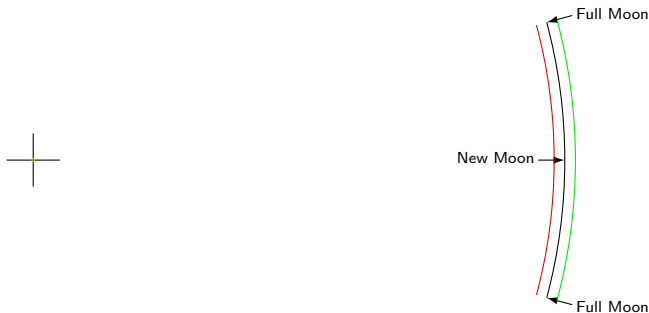
- I. $\text{Mass}_{\text{Moon}} = 7.348 \times 10^{22} \text{ kg}$
- II. $\text{Mass}_{\text{Earth}} = 5.972 \times 10^{24} \text{ kg}$
- III. $\text{Dist}_{\text{Moon,Earth}} = (3.564 \leftrightarrow 4.067) \times 10^8 \text{ m}$

$$F_{S,M} = (4.193 \leftrightarrow 4.531) \times 10^{20} \text{ Nt}$$

- I. $\text{Mass}_{\text{Moon}} = 7.348 \times 10^{22} \text{ kg}$
- II. $\text{Mass}_{\text{Sun}} = 1.989 \times 10^{30} \text{ kg}$
- III. $\text{Dist}_{\text{Moon,Sun}} = (1.467 \leftrightarrow 1.525) \times 10^{11} \text{ m}$

$$F_{S,M} / F_{E,M} = (2.56 \leftrightarrow 1.82) \approx 2.16 \approx 2$$

Compare Earth and Moon Trajectories



The Moon's trajectory is always concave toward the Sun.
The Moon never moves "backwards".

The Moon never moves “backwards”, nor do you

- ▶ $\text{Speed}_{E,S} \approx 30,000 \text{ m/s}$
- ▶ $\text{Speed}_{M,E} \approx 1,020 \text{ m/s}$
- ▶ $\text{Speed}_{us,E} \approx 460 \text{ m/s}$
- ▶ Geosynchronous Satellite
 $\text{Speed}_{GS,E} \approx 3,066 \text{ m/s}$
- ▶ Low Earth Orbit Satellite
 $\text{Speed}_{LEOS,E} \approx 7,400 \text{ m/s}$
- ▶ LaGrange Point
 $\text{Speed}_{L1,E} \approx 300 \text{ m/s}$

3753 Cruithne : an Asteroid

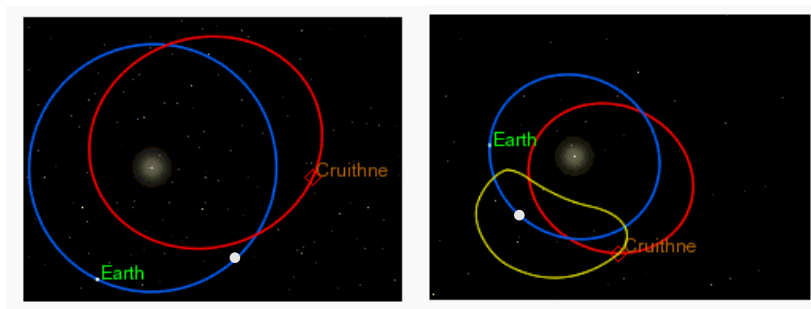


Figure 1 : Lifted from [Unknown Blogger](#)

Closest approach to Earth occurs in November of each year.

Closest approach to Sun occurs a couple of months later