Gravity

\[ \ddot{r}_i = \sum_{\substack{j=1 \atop j \neq i}}^{N} m_j \frac{r_j - r_i}{|r_j - r_i|^3} \]

Newton (1687)
Third burn successful. Exceeded Mars orbit and kept going to the Asteroid Belt.
Third burn successful. Exceeded Mars orbit and kept going to the Asteroid Belt.
First 100 Years
First 1000 years
Semi-major axis
First 1000 years
First 9 million years
Collisions with Planets and the Sun

The graph shows the cumulative probability of collision over time for different objects:
- Green line: Sun
- Cyan line: Mercury
- Red line: Venus
- Blue dotted line: Earth

The x-axis represents time in Myr (millions of years), ranging from 0 to 12 Myr. The y-axis represents the cumulative probability of collision, ranging from 0.00 to 0.25.
Stability of the Solar System

Laskar & Gastineau 2009