|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Axial Rotaional Period  (Rev/Day) | Mean Equatorial Radius  (km) | Gravitational Parameter  *µ* “ *Gm*p*km*3{*sec*2q | Semi-major Axis of orbit  (km) | Orbital Period  (sec) | Eccentricity of  Orbit | Inclination of Orbit to Ecliptic  (deg) |
| ☉ Sun | 0.0394011 | 695990 | 132712440017.99 | - | - | - | - |
| ☾ Moon | 0.0366004 | 1738.2 | 4902.8005821478 | 384400  (around Earth) | 2360592  27.32 Earth Days | 0.0554 | 5.16 |
| ☿ Mercury | 0.0170514 | 2439.7 | 22032.080486418 | 57909101 | 7600537  87.97 Earth Days | 0.20563661 | 7.00497902 |
| ♀ Venus | 0.0041149  (Retrograde) | 6051.9 | 324858.59882646 | 108207284 | 19413722  224.70 Earth Days | 0.00676399 | 3.39465605 |
| ⊕ Earth | 1.0027378 | 6378.1363 | 398600.4415 | 149597898 | 31558205  365.26 Earth Days | 0.01673163 | 0.00001531 |
| ♂ Mars | 0.9747000 | 3397 | 42828.314258067 | 227944135 | 59356281  686.99 Earth Days | 0.09336511 | 1.84969142 |
| ♃ Jupiter | 2.4181573 | 71492 | 126712767.8578 | 778279959 | 374479305  11.87 Years | 0.04853590 | 1.30439695 |
| ♄ Saturn | 2.2522053 | 60268 | 37940626.061137 | 1427387908 | 930115906  29.47 Years | 0.05550825 | 2.48599187 |
| ⛢ Uranus | 1.3921114  (Retrograde) | 25559 | 5794549.0070719 | 2870480873 | 2652503938  84.05 Years | 0.04685740 | 0.77263783 |
| ♆Neptune | 1.4897579 | 25269 | 6836534.0638793 | 4498337290 | 5203578080  164.89 Years | 0.00895439 | 1.77004347 |
| ♇ Pluto | -0.1565620  (Retrograde) | 1162 | 981.600887707 | 5907150229 | 7830528509  248.13 Years | 0.24885238 | 17.14001206 |

* First three columns of the body data are consistent with GMAT 2020a default values, which are mainly from JPL’s ephemerides file de405.spk
* The rest of the data are from JPL website(<https://ssd.jpl.nasa.gov/?planet_pos>, retrieved at 09/01/2020) based on E.M.
* Standish’s “Keplerian Elements for Approximate Positions of the Major Planets”