SPACE SYSTEMS ENGINEERING
Physical Data

Astronomical Data for the Sun, the Planets and the Moon

Object	Radius (km)	Mass (kg)	Sidereal Rotation Period	Inclination of Equator to Orbit Plane	Semimajor Axis of Orbit (km)	Orbit Eccentricity	Inclination of Orbit to the Ecliptic Plane	Orbit Sidereal Period
Sun	696,000	1.989×10^{30}	25.38 d	7.25°	—	—	—	—
Mercury	2440	330.2×10^{21}	58.65 d	0.01°	57.91×10^{6}	0.2056	7.00°	87.97 d
Venus	6052	4.869×10^{24}	243 d*	177.4°	108.2×10^{6}	0.0067	3.39°	224.7 d
Earth	6378	5.974×10^{24}	23.9345 h	23.45°	149.6×10^{6}	0.0167	0.00°	365.256 d
(Moon)	1737	73.48×10^{21}	27.32 d	6.68°	384.4×10^{3}	0.0549	5.145°	27.322 d
Mars	3396	641.9×10^{21}	24.62 h	25.19°	227.9×10^{6}	0.0935	1.850°	1.881 y
Jupiter	71,490	1.899×10^{27}	9.925 h	3.13°	778.6×10^{6}	0.0489	1.304°	11.86 y
Saturn	60,270	568.5×10^{24}	10.66 h	26.73°	1.433×10^{9}	0.0565	2.485°	29.46 y
Uranus	25,560	86.83×10^{24}	17.24 h*	97.77°	2.872×10^{9}	0.0457	0.772°	84.01 y
Neptune	24,760	102.4×10^{24}	16.11 h	28.32°	4.495×10^{9}	0.0113	1.769	164.8 y
(Pluto)	1195	12.5×10^{21}	6.387 d*	122.5°	5.870×10^{9}	0.2444	17.16°	247.7 y

*Retrograde

Gravitational Parameter μ and Sphere of Influence (SOI) for the Sun, the Planets and the Moon

Celestial Body	μ (km^3/s^2)	SOI Radius (km)
Sun	132,712,000,000	—
Mercury	22,030	112,000
Venus	324,900	616,000
Earth	398,600	925,000
Earth's moon	4903	66,100
Mars	42,828	577,000
Jupiter	126,686,000	48,200,000
Saturn	37,931,000	54,800,000
Uranus	5,794,000	51,800,000
Neptune	6,835,100	86,600,000
Pluto	830	3,080,000

Conversion Factors

1 ft	= 0.3048 m
1 mile (mi)	= 1.609 km
1 nautical mile (n mi)	= 1.151 mi = 1.852 km
1 mi/h	= 0.0004469 km/s
1 lb (mass)	= 0.4536 kg
1 lb (force)	= 4.448 N
1 psi	= 6895 kPa
1 astronomical unit (AU)	= 149,597,870.700 km