

ELEMENTS OF PLANETARY ORBITS

MEAN ELEMENTS FOR THE EPOCH 2009 JAN. 0.5 TT

Planet	at the Epoch	Mean Longitude of the Perihelion	of the Ascending Node	Inclination to the Ecliptic	Eccentricity	Mean Distance
	L °	ω °	Ω °	i °	e	a
Mercury	23.894	77.596	48.438	7.005	0.20563	0.38710
Venus	48.308	131.690	76.761	3.395	0.00677	0.72333
Earth	100.289	103.092	0.01670	1.00000
Mars	278.055	336.226	49.628	1.850	0.09341	1.52368
Jupiter	307.598	14.476	100.464	1.303	0.04851	5.20260
Saturn	160.185	93.234	113.744	2.489	0.05548	9.55491
Uranus	352.740	173.139	74.053	0.773	0.04629	19.21845
Neptune	324.137	48.252	131.883	1.769	0.00899	30.11039

Planet	Perihelion Distance	Aphelion Distance	Sidereal Mean Daily Motion	Sidereal Period	Mean Synodic Period	Mean Orbital Velocity
	q	Q	n °	P	d	km/sec
Mercury	0.3075	0.4667	4.09234	87.969	115.88	47.87
Venus	0.7184	0.7282	1.60214	224.701	583.92	35.02
Earth	0.9833	1.0167	0.98561	365.256	..	29.79
Mars	1.3814	1.6660	0.52404	686.980	779.94	24.13
Jupiter	4.950	5.455	0.08306	4332.59	398.88	13.06
Saturn	9.025	10.085	0.03337	10759.21	378.09	9.65
Uranus	18.329	20.108	0.01170	30684.6	369.66	6.80
Neptune	29.840	30.381	0.00597	60191.2	367.49	5.43

OSCULATING ELEMENTS FOR THE EPOCH 2009 JUNE 18.0 TT

Planet	M	ω	Ω	i	e	a
Pluto	27.794	114.684	110.334	17.115	0.25168	39.713

These elements are referred to the mean ecliptic and equinox of J2000.0