

Dwarf Planets of the Solar System



Cosmic Octave tuning data provided by

www.planetware.de
Please note:

Commas in German writing = , (instead of .)

Date of last obs. = Last observation used in the fit

Date in German writing = day.month.year

hz. = Frequency in Hertz (cycle per second)

oct. = Number of octaves from the period

A¹ = Corresponding concert pitch A

cent = deviation +/-50 cent from 440 Hz

bpm = beats per minute

Classifications:**ATIRA** An asteroid orbit contained entirely within the orbit of the Earth ($Q < 0.983$ au). Also known as an Interior Earth Object.**ATEN** Near-Earth asteroid orbits similar to that of 2062 Aten ($a < 1.0$ au; $Q > 0.983$ au).**AMOR** Near-Earth asteroid orbits similar to that of 1221 Amor (1.017 au $< q < 1.3$ au).

Celestial Body		Period		Date of last obs.	Tone			a ¹ cent		Tempo bpm	NASA source
		days	year		hz	note	oct.	Hz	+/- 50		
2020 AV2	<i>Atira</i>	151,191479	0,41	23.01.2020	164,40	E	31	438,88	-4,4	77,1	Link
367943 Duende (2012 DA14)	<i>Aten</i>	317,205934	0,87	21.02.2013	156,71	D#	32	443,25	12,7	73,5	Link
2062 Aten	<i>Aten</i>	347,213448	0,95	06.02.2015	143,17	D	32	429,02	-43,7	67,1	Link

APOLLO Near-Earth asteroid orbits which cross the Earth's orbit similar to that of 1862 Apollo ($a > 1.0$ au; $q < 1.017$ au).

4581 Asclepius (1989 FC)		377,729256	1,03	10.05.2019	131,60	C	32	442,66	10,4	61,7	Link
2020 CD3		377,757425	1,03	27.02.2020	131,59	C	32	442,62	10,3	61,7	Link
2063 Bacchus (1977 HB)		408,871152	1,12	31.05.2016	243,16	B	33	433,26	-26,7	114,0	Link
25143 Itokawa (1998 SF36)		556,529859	1,52	04.02.2019	178,64	F	33	450,15	39,5	83,7	Link
1685 Toro (1948 OA)		584,158393	1,60	15.06.2019	170,19	F	33	428,86	-44,4	79,8	Link
4450 Pan (1987 SY)		632,805024	1,73	31.01.2020	157,11	D#	33	444,38	17,1	73,6	Link
433 Eros (A898 PA)	<i>Amor</i>	643,065402	1,76	13.02.2019	154,60	D#	33	437,29	-10,7	72,5	Link
1864 Daedalus (1971 FA)		644,965498	1,77	07.02.2020	154,15	D#	33	436,00	-15,8	72,3	Link
1862 Apollo (1932 HA)		651,219646	1,78	27.04.2019	152,67	D#	33	431,81	-32,5	71,6	Link
385250 (2001 DH47)	<i>Mars crossing</i>	687,056939	1,88	23.04.2018	144,70	D	33	433,62	-25,3	67,8	Link
1866 Sisyphus (1972 XA)		951,842131	2,61	07.02.2020	208,90	G#	34	442,65	10,4	97,9	Link
1221 Amor (1932 EA1)	<i>Amor</i>	971,359460	2,66	24.01.2020	204,70	G#	43	433,75	-24,8	96,0	Link
2212 Hephaistos (1978 SB)		1158,874477	3,17	25.11.2019	171,58	F	34	432,36	-30,3	80,4	Link

MAIN-BELT ASTEROIDS Asteroids with orbital elements constrained by (2.0 au $< a < 3.2$ au; $q > 1.666$ au).

149 Medusa		1171,204199	3,21	06.01.2020	169,77	F	34	427,81	-48,7	79,6	Link
8 Flora		1193,029574	3,27	13.05.2019	166,67	E	34	444,95	19,4	78,1	Link
1198 Atlantis (1931 RA)		1233,849682	3,38	05.01.2020	161,16	E	34	430,23	-38,9	75,5	Link
5731 Zeus (1988 VP4)		1244,641623	3,41	02.10.2018	159,76	D#	34	451,86	46,1	74,9	Link
40 Harmonia		1246,649048	3,41	07.01.2020	159,50	D#	34	451,14	43,3	74,8	Link
896 Sphinx (A918 PE)		1262,279506	3,46	03.01.2020	157,53	D#	34	445,55	21,7	73,8	Link
2202 Pele (1972 RA)		1265,969993	3,47	12.02.2018	157,07	D#	34	444,25	16,6	73,6	Link
27 Euterpe		1312,667687	3,59	06.01.2020	151,48	D#	34	428,45	-46,1	71,0	Link
4 Vesta		1325,934723	3,63	23.03.2017	149,96	D	34	449,38	36,5	70,3	Link
30 Urania		1328,521209	3,64	06.12.2019	149,67	D	34	448,51	33,1	70,2	Link

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9 Metis	1346,890283	3,69	17.05.2018	147,63	D	34	442,39	9,4	69,2	Link
17473 Freddiemercury (1991 FM3)	1349,256811	3,69	06.12.2019	147,37	D	34	441,61	6,3	69,1	Link
60 Echo	1351,358643	3,70	08.01.2020	147,14	D	34	440,93	3,6	69,0	Link
4227 Kaali (1942 DC)	1354,357054	3,71	07.01.2020	146,82	D	34	439,95	-0,2	68,8	Link
273 Atropos	1354,169889	3,71	07.01.2020	146,84	D	34	440,01	0,0	68,8	Link
1108 Demeter (1929 KA)	1381,748507	3,78	11.05.2019	143,91	D	34	431,23	-34,9	67,5	Link
42 Isis	1393,903765	3,82	07.01.2020	142,65	C#	34	452,89	50,0	66,9	Link
19 Fortuna	1394,586684	3,82	20.08.2019	142,58	C#	34	452,67	49,1	66,8	Link
55555 DNA (2001 YR2)	1498,886200	4,10	07.01.2020	132,66	C	34	446,21	24,3	62,2	Link
13 Egeria	1510,123386	4,13	18.09.2018	131,67	C	34	442,89	11,3	61,7	Link
3811 Karma (1953 TH)	1510,969928	4,14	06.01.2020	131,60	C	34	442,64	10,4	61,7	Link
389 Industria (A894 EE)	1538,609672	4,21	05.01.2020	129,23	C	34	434,69	-21,0	60,6	Link
33179 Arsenewenger (1998 FY15)	1543,760048	4,23	08.05.2019	128,80	C	34	433,24	-26,8	60,4	Link
78 Diana	1547,939422	4,24	06.01.2020	128,46	C	34	432,07	-31,5	60,2	Link
407 Arachne (A895 TB)	1553,509230	4,25	06.01.2020	127,99	C	34	430,52	-37,7	60,0	Link
15 Eunomia	1570,418187	4,30	18.07.2018	253,24	B	35	451,21	43,6	118,7	Link
26 Proserpina	1580,326532	4,33	01.12.2019	251,65	B	35	448,38	32,7	118,0	Link
3 Juno	1592,013770	4,36	07.01.2020	249,80	B	35	445,09	19,9	117,1	Link
97 Klotho	1592,671861	4,36	07.01.2020	249,69	B	35	444,91	19,2	117,0	Link
324 Bamberg	1603,807559	4,39	17.09.2018	247,96	B	35	441,82	7,1	116,2	Link
34 Circe	1607,896342	4,40	06.12.2019	247,33	B	35	440,69	2,7	115,9	Link
103 Hera	1622,409316	4,44	07.01.2020	245,12	B	35	436,75	-12,8	114,9	Link
140 Siwa	1651,816356	4,52	05.01.2020	240,75	B	35	428,98	-43,9	112,9	Link
128 Nemesis	1664,741998	4,56	04.01.2020	238,89	A#	35	450,96	42,6	112,0	Link
55 Pandora	1675,194840	4,59	08.11.2019	237,39	A#	35	448,14	31,7	111,3	Link
1 Ceres	1681,770740	4,60	02.03.2019	236,47	A#	35	446,39	25,0	110,8	Link
88 Thisbe	1683,153887	4,61	21.10.2018	236,27	A#	35	446,02	23,5	110,8	Link
2 Pallas	1687,410991	4,62	09.05.2019	235,68	A#	35	444,90	19,2	110,5	Link
658 Asteria (A908 BL)	1759,669899	4,82	07.01.2020	226,00	A	35	452,00	46,6	105,9	Link
81 Terpsichore	1760,814261	4,82	05.01.2020	225,85	A	35	451,70	45,4	105,9	Link
1100 Arnica (1928 SD)	1800,964129	4,93	07.01.2020	220,82	A	35	441,63	6,4	103,5	Link
1930 Lucifer (1964 UA)	1803,243287	4,94	27.11.2019	220,54	A	35	441,07	4,2	103,4	Link
4305 Clapton (1976 EC)	1816,393576	4,97	04.01.2020	218,94	A	35	437,88	-8,4	102,6	Link
16 Psyche	1825,120871	5,00	03.09.2019	217,89	A	35	435,79	-16,7	102,1	Link
2878 Panacea (1980 RX)	1941,689826	5,32	07.01.2020	204,81	G#	35	433,98	-23,8	96,0	Link
704 Interamnia (1910 KU)	1953,930866	5,35	25.02.2018	203,53	G#	35	431,26	-34,7	95,4	Link
451 Patientia	1955,104058	5,35	20.10.2018	203,41	G#	35	431,00	-35,8	95,3	Link
133 Cyrene	1959,595401	5,37	05.01.2020	202,94	G#	35	430,02	-39,7	95,1	Link
100 Hekate	1983,427530	5,43	05.01.2020	200,50	G	35	450,11	39,3	94,0	Link
52 Europa	1988,068744	5,44	07.01.2020	200,03	G	35	449,06	35,3	93,8	Link
120 Lachesis	2011,602739	5,51	05.01.2020	197,69	G	35	443,81	14,9	92,7	Link
24 Themis	2028,607813	5,55	15.09.2018	196,40	G	35	440,09	+0,3	91,9	Link
10 Hygiea	2034,688646	5,57	04.01.2020	195,45	G	35	438,77	-4,8	91,6	Link
1027 Aesculapia (A923 YO11)	2045,847916	5,60	04.01.2020	194,39	G	35	436,38	-14,3	91,1	Link
31 Euphrosyne	2047,295511	5,61	15.06.2018	194,25	G	35	436,07	-15,5	91,1	Link
94 Aurora	2048,401434	5,61	22.10.2018	194,14	G	35	435,84	-16,5	91,0	Link
511 Davida (1903 LU)	2056,526821	5,63	16.09.2018	193,38	G	35	434,11	-23,1	90,6	Link
318 Magdalena	2085,953404	5,71	06.01.2020	190,65	G	35	427,99	-47,9	89,4	Link

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OUTER MAIN-BELT ASTEROIDS Asteroids with orbital elements constrained by (3.2 au < a < 4.6 au).

81948 Eno (2000 OM69)	2103,617052	5,76	24.01.2019	189,05	F# 35	449,63	37,5	88,6	Link
580 Selene	2117,029763	5,80	31.10.2019	187,85	F# 35	446,78	26,5	88,1	Link
65 Cybele	2316,170372	6,34	18.09.2018	171,70	F 35	432,65	-29,2	80,5	Link
87 Sylvia	2373,818440	6,50	08.09.2018	167,53	E 35	447,25	28,3	78,5	Link
87 Sylvia I Romulus	3,654000			212,57	G# 26	450,42	40,5	99,6	Link
87 Sylvia II Remus	1,373000			141,43	C# 24	449,01	35,1	66,3	Link
107 Camilla	2382,998058	6,52	22.10.2018	166,88	E 35	445,52	21,6	78,2	Link
107 Camilla I	0,500000			194,18	G 23	435,92	-16,1	91,0	
107 Camilla II	3,722000			208,68	G# 26	442,19	8,6	97,8	Link

JUPITER TROJAN Asteroids trapped in Jupiter's L4/L5 Lagrange points (4.6 au < a < 5.5 au; e < 0.3).

588 Achilles (A906 DN)	4342,893776	11,89	06.01.2020	183,14	F# 36	435,59	-17,5	85,8	Link
617 Patroclus (A906 UL)	4350,950858	11,91	14.06.2017	182,80	F# 36	434,78	-20,7	85,7	Link
617 Patroclus 1 Menoetius	4,283000			181,35	F# 26	431,33	-34,5	85,0	Link
624 Hektor (A907 CF)	4405,802306	12,06	22.10.2018	180,53	F# 36	429,37	-42,4	84,6	Link
624 Hektor 1 Skamandrios	2,965079			130,98	C 25	440,56	2,2	61,4	Link
4946 Askalaphus (1988 BW1)	4480,149376	12,27	24.11.2019	177,53	F 36	447,35	28,7	83,2	Link

CENTAUR Objects with orbits between Jupiter and Neptune (5.5 au < a < 30.1 au).

2060 Chiron (1977 UB)	18492,654098	50,63	04.01.2020	172,04	F 38	433,51	-25,7	80,6	Link
10199 Chariklo (1997 CU26)	23033,122419	63,08	06.05.2019	138,13	C# 38	438,52	-5,8	64,7	Link
54598 Bienor (2000 QC243)	24355,099915	66,68	29.12.2019	130,63	C 38	439,38	-2,4	61,2	Link
5145 Pholus (1992 AD)	33594,934299	91,98	19.04.2018	189,40	F# 39	450,47	40,7	88,8	Link
7066 Nessus (1993 HA2)	44670,414466	122,30	26.05.2004	142,44	C# 39	452,22	47,4	66,8	Link
10370 Hylonome (1995 DW2)	46175,844516	126,42	14.06.2010	137,80	C# 39	437,48	-9,9	64,6	Link
55576 Amycus (2002 GB10)	46214,888705	126,53	15.08.2007	137,68	C# 39	437,11	-11,4	64,5	Link
385695 (2005 TO74)	60085,675925	164,51	06.10.2013	211,79	G# 40	448,78	34,2	99,3	Link
385571 Otrera (2004 UP10)	60420,650387	165,42	06.10.2013	210,62	G# 40	446,29	24,6	98,7	Link

TRANS-NEPTUNIAN OBJECTS with orbits outside Neptune (a > 30.1 au).

38083 Rhadamanthus (1999 HX11)	89029,124540	243,75	07.06.2008	142,94	C# 40	428,34	-46,5	67,0	Link
47171 Lempo	89870,255184	246,05	28.10.2017	141,60	C# 40	449,56	37,2	66,4	Link
47171 Lempo I (Paha)	50,300000			247,07	B 30	440,23	0,9	115,8	
47171 Lempo II (Hiisi)	1,907000			203,65	G# 25	431,52	-33,7	95,5	Link
90482 Orcus (2004 DW)	89556,925563	245,19	04.01.2020	142,10	C# 40	451,13	43,3	66,6	Link
28978 Ixion (2001 KX76)	91769,410970	251,25	20.06.2018	138,67	C# 40	440,26	1,0	65,0	Link
307261 (2002 MS4)	99575,306218	272,62	14.06.2018	127,80	C 40	429,87	-40,3	59,6	Link
120347 Salacia (2004 SB60)	100072,934124	273,98	21.09.2019	127,17	C 40	427,73	-49,0	59,9	Link
20000 Varuna (2000 WR106)	101980,236509	279,21	22.05.2019	249,57	B 41	444,69	18,4	117,0	Link
136108 Haumea (2003 EL61)	103647,162991	283,77	26.08.2019	245,56	B 41	437,54	-9,7	115,1	Link
50000 Quaoar (2002 LM60)	105494,677790	288,83	31.08.2019	241,26	B 41	429,88	-40,3	113,1	Link
88611 Teharonhiawako (2001 QT297)	107577,117573	294,53	26.10.2019	236,59	A# 41	446,62	25,9	110,9	Link
53311 Deucalion (1999 HU11)	107688,172945	294,83	25.04.2014	236,35	A# 41	446,16	24,1	110,8	Link
486958 Arrokoth (2014 MU69)	109062,364943	298,60	22.10.2014	233,37	A# 41	440,54	2,1	109,4	Link
58534 Logos (1997 CQ29)	110683,376457	303,03	18.05.2012	229,95	A# 41	434,09	-23,4	107,8	Link
136472 Makemake (2005 FY9)	111844,723623	306,21	12.05.2019	227,56	A# 41	429,58	-41,5	106,7	Link
174567 Varda (2003 MW12)	114365,640202	313,12	04.05.2019	222,55	A 41	445,09	19,9	104,3	Link
84522 (2002 TC302)	149253,956365	408,64	31.10.2019	170,53	F 41	429,70	-41,0	79,9	Link

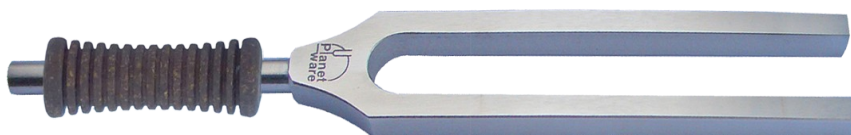
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225088 (2007 OR10)	202427,474429	554,22	20.09.2015	251,46	B	42	448,06	31,4	117,9	Link
136199 Eris (2003 UB313)	204199,413438	559,07	03.12.2019	249,28	B	42	444,17	16,3	116,9	Link
90377 Sedna (2003 VB12)	3903673,419428	10687,68	07.12.2018	208,64	G#	46	442,09	8,2	97,8	Link

Please note:

When the NASA get more detailed informations of a distant space object they may improve the orbit determination. Logically, a slightly altered orbital period leads to a slightly altered audio frequency.

TUNING FORKS



Tuning forks with the octave frequencies of the dwarf planets are available as custom-made products from Planetware.

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