

Sun - Apparent data

Date	Right Ascension	Declination	Distance	Diameter
0 h TT	h m s	d m s	au	arc sec
12/31/2022	18 40 19.378	-23 06 52.65	0.9833615	1951.74
01/01/2023	18 44 44.504	-23 02 23.25	0.9833367	1951.79
01/02/2023	18 49 09.314	-22 57 26.27	0.9833176	1951.83
01/03/2023	18 53 33.779	-22 52 01.86	0.9833042	1951.86
01/04/2023	18 57 57.871	-22 46 10.19	0.9832970	1951.87
01/05/2023	19 02 21.562	-22 39 51.46	0.9832958	1951.87
01/06/2023	19 06 44.827	-22 33 05.86	0.9833010	1951.86
01/07/2023	19 11 07.639	-22 25 53.57	0.9833124	1951.84
01/08/2023	19 15 29.974	-22 18 14.81	0.9833302	1951.80
01/09/2023	19 19 51.809	-22 10 09.80	0.9833543	1951.76
01/10/2023	19 24 13.120	-22 01 38.76	0.9833845	1951.70
01/11/2023	19 28 33.886	-21 52 41.91	0.9834209	1951.62
01/12/2023	19 32 54.087	-21 43 19.51	0.9834632	1951.54
01/13/2023	19 37 13.704	-21 33 31.79	0.9835113	1951.45
01/14/2023	19 41 32.718	-21 23 19.02	0.9835649	1951.34
01/15/2023	19 45 51.111	-21 12 41.47	0.9836239	1951.22
01/16/2023	19 50 08.868	-21 01 39.42	0.9836879	1951.09
01/17/2023	19 54 25.971	-20 50 13.17	0.9837566	1950.96
01/18/2023	19 58 42.402	-20 38 23.03	0.9838297	1950.81
01/19/2023	20 02 58.146	-20 26 09.34	0.9839069	1950.66
01/20/2023	20 07 13.180	-20 13 32.42	0.9839879	1950.50
01/21/2023	20 11 27.486	-20 00 32.65	0.9840723	1950.33
01/22/2023	20 15 41.041	-19 47 10.39	0.9841600	1950.16
01/23/2023	20 19 53.826	-19 33 26.00	0.9842509	1949.98
01/24/2023	20 24 05.824	-19 19 19.85	0.9843450	1949.79
01/25/2023	20 28 17.021	-19 04 52.33	0.9844426	1949.60
01/26/2023	20 32 27.408	-18 50 03.81	0.9845438	1949.40
01/27/2023	20 36 36.977	-18 34 54.68	0.9846490	1949.19
01/28/2023	20 40 45.724	-18 19 25.35	0.9847583	1948.97
01/29/2023	20 44 53.645	-18 03 36.23	0.9848721	1948.75
01/30/2023	20 49 00.738	-17 47 27.71	0.9849906	1948.51
01/31/2023	20 53 07.001	-17 31 00.20	0.9851140	1948.27
02/01/2023	20 57 12.434	-17 14 14.12	0.9852426	1948.02
02/02/2023	21 01 17.039	-16 57 09.87	0.9853764	1947.75
02/03/2023	21 05 20.817	-16 39 47.86	0.9855155	1947.48
02/04/2023	21 09 23.773	-16 22 08.49	0.9856601	1947.19
02/05/2023	21 13 25.910	-16 04 12.16	0.9858102	1946.89
02/06/2023	21 17 27.234	-15 45 59.26	0.9859657	1946.59
02/07/2023	21 21 27.754	-15 27 30.19	0.9861268	1946.27
02/08/2023	21 25 27.478	-15 08 45.34	0.9862932	1945.94
02/09/2023	21 29 26.415	-14 49 45.10	0.9864649	1945.60
02/10/2023	21 33 24.577	-14 30 29.85	0.9866417	1945.25
02/11/2023	21 37 21.975	-14 11 00.00	0.9868234	1944.90
02/12/2023	21 41 18.620	-13 51 15.92	0.9870098	1944.53
02/13/2023	21 45 14.526	-13 31 18.02	0.9872006	1944.15
02/14/2023	21 49 09.704	-13 11 06.69	0.9873954	1943.77
02/15/2023	21 53 04.165	-12 50 42.35	0.9875939	1943.38
02/16/2023	21 56 57.921	-12 30 05.40	0.9877958	1942.98
02/17/2023	22 00 50.978	-12 09 16.28	0.9880006	1942.58
02/18/2023	22 04 43.345	-11 48 15.41	0.9882079	1942.17

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Date	Right Ascension	Declination	Distance	Diameter
0 h TT	h m s	d m s	au	arc sec
02/19/2023	22 08 35.028	-11 27 03.25	0.9884174	1941.76
02/20/2023	22 12 26.034	-11 05 40.22	0.9886288	1941.34
02/21/2023	22 16 16.373	-10 44 06.76	0.9888421	1940.93
02/22/2023	22 20 06.054	-10 22 23.30	0.9890571	1940.50
02/23/2023	22 23 55.091	-10 00 30.28	0.9892740	1940.08
02/24/2023	22 27 43.499	-09 38 28.12	0.9894929	1939.65
02/25/2023	22 31 31.291	-09 16 17.26	0.9897140	1939.22
02/26/2023	22 35 18.485	-08 53 58.11	0.9899375	1938.78
02/27/2023	22 39 05.095	-08 31 31.10	0.9901637	1938.33
02/28/2023	22 42 51.139	-08 08 56.65	0.9903927	1937.89
03/01/2023	22 46 36.634	-07 46 15.17	0.9906247	1937.43
03/02/2023	22 50 21.599	-07 23 27.05	0.9908599	1936.97
03/03/2023	22 54 06.051	-07 00 32.70	0.9910984	1936.51
03/04/2023	22 57 50.012	-06 37 32.51	0.9913403	1936.03
03/05/2023	23 01 33.500	-06 14 26.85	0.9915857	1935.55
03/06/2023	23 05 16.537	-05 51 16.10	0.9918347	1935.07
03/07/2023	23 08 59.146	-05 28 00.63	0.9920872	1934.58
03/08/2023	23 12 41.349	-05 04 40.79	0.9923433	1934.08
03/09/2023	23 16 23.169	-04 41 16.96	0.9926029	1933.57
03/10/2023	23 20 04.631	-04 17 49.47	0.9928659	1933.06
03/11/2023	23 23 45.760	-03 54 18.68	0.9931322	1932.54
03/12/2023	23 27 26.578	-03 30 44.93	0.9934014	1932.02
03/13/2023	23 31 07.110	-03 07 08.57	0.9936735	1931.49
03/14/2023	23 34 47.378	-02 43 29.96	0.9939480	1930.95
03/15/2023	23 38 27.403	-02 19 49.46	0.9942246	1930.42
03/16/2023	23 42 07.205	-01 56 07.43	0.9945029	1929.88
03/17/2023	23 45 46.803	-01 32 24.26	0.9947824	1929.34
03/18/2023	23 49 26.213	-01 08 40.32	0.9950629	1928.79
03/19/2023	23 53 05.453	-00 44 56.02	0.9953437	1928.25
03/20/2023	23 56 44.538	-00 21 11.74	0.9956247	1927.70
03/21/2023	00 00 23.486	00 02 32.12	0.9959054	1927.16
03/22/2023	00 04 02.314	00 26 15.19	0.9961858	1926.62
03/23/2023	00 07 41.041	00 49 57.06	0.9964657	1926.08
03/24/2023	00 11 19.685	01 13 37.36	0.9967452	1925.54
03/25/2023	00 14 58.262	01 37 15.69	0.9970243	1925.00
03/26/2023	00 18 36.792	02 00 51.68	0.9973032	1924.46
03/27/2023	00 22 15.291	02 24 24.94	0.9975821	1923.92
03/28/2023	00 25 53.777	02 47 55.11	0.9978610	1923.38
03/29/2023	00 29 32.269	03 11 21.81	0.9981403	1922.84
03/30/2023	00 33 10.785	03 34 44.67	0.9984200	1922.31
03/31/2023	00 36 49.344	03 58 03.36	0.9987003	1921.77
04/01/2023	00 40 27.967	04 21 17.52	0.9989814	1921.23
04/02/2023	00 44 06.674	04 44 26.80	0.9992634	1920.68
04/03/2023	00 47 45.485	05 07 30.87	0.9995463	1920.14
04/04/2023	00 51 24.422	05 30 29.39	0.9998303	1919.59
04/05/2023	00 55 03.507	05 53 22.06	1.0001154	1919.05
04/06/2023	00 58 42.763	06 16 08.54	1.0004017	1918.50
04/07/2023	01 02 22.212	06 38 48.53	1.0006891	1917.95
04/08/2023	01 06 01.878	07 01 21.72	1.0009775	1917.39
04/09/2023	01 09 41.783	07 23 47.81	1.0012669	1916.84

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Date	Right Ascension	Declination	Distance	Diameter
0 h TT	h m s	d m s	au	arc sec
04/10/2023	01 13 21.947	07 46 06.48	1.0015570	1916.29
04/11/2023	01 17 02.391	08 08 17.42	1.0018476	1915.73
04/12/2023	01 20 43.134	08 30 20.31	1.0021383	1915.17
04/13/2023	01 24 24.191	08 52 14.81	1.0024288	1914.62
04/14/2023	01 28 05.578	09 14 00.58	1.0027186	1914.07
04/15/2023	01 31 47.310	09 35 37.28	1.0030074	1913.51
04/16/2023	01 35 29.401	09 57 04.53	1.0032946	1912.97
04/17/2023	01 39 11.865	10 18 22.00	1.0035799	1912.42
04/18/2023	01 42 54.715	10 39 29.31	1.0038630	1911.88
04/19/2023	01 46 37.964	11 00 26.12	1.0041435	1911.35
04/20/2023	01 50 21.624	11 21 12.06	1.0044213	1910.82
04/21/2023	01 54 05.705	11 41 46.79	1.0046963	1910.30
04/22/2023	01 57 50.218	12 02 09.95	1.0049684	1909.78
04/23/2023	02 01 35.169	12 22 21.17	1.0052378	1909.27
04/24/2023	02 05 20.569	12 42 20.12	1.0055044	1908.76
04/25/2023	02 09 06.423	13 02 06.43	1.0057684	1908.26
04/26/2023	02 12 52.741	13 21 39.78	1.0060301	1907.77
04/27/2023	02 16 39.531	13 40 59.81	1.0062894	1907.27
04/28/2023	02 20 26.800	14 00 06.20	1.0065467	1906.79
04/29/2023	02 24 14.559	14 18 58.62	1.0068020	1906.30
04/30/2023	02 28 02.816	14 37 36.74	1.0070555	1905.82
05/01/2023	02 31 51.581	14 56 00.27	1.0073074	1905.35
05/02/2023	02 35 40.863	15 14 08.88	1.0075578	1904.87
05/03/2023	02 39 30.671	15 32 02.28	1.0078069	1904.40
05/04/2023	02 43 21.017	15 49 40.19	1.0080547	1903.93
05/05/2023	02 47 11.910	16 07 02.30	1.0083014	1903.47
05/06/2023	02 51 03.361	16 24 08.36	1.0085470	1903.00
05/07/2023	02 54 55.377	16 40 58.09	1.0087915	1902.54
05/08/2023	02 58 47.967	16 57 31.21	1.0090348	1902.08
05/09/2023	03 02 41.137	17 13 47.44	1.0092768	1901.63
05/10/2023	03 06 34.889	17 29 46.51	1.0095171	1901.18
05/11/2023	03 10 29.229	17 45 28.13	1.0097554	1900.73
05/12/2023	03 14 24.156	18 00 51.98	1.0099914	1900.28
05/13/2023	03 18 19.671	18 15 57.78	1.0102247	1899.84
05/14/2023	03 22 15.774	18 30 45.20	1.0104548	1899.41
05/15/2023	03 26 12.465	18 45 13.97	1.0106814	1898.99
05/16/2023	03 30 09.741	18 59 23.77	1.0109041	1898.57
05/17/2023	03 34 07.597	19 13 14.32	1.0111225	1898.16
05/18/2023	03 38 06.028	19 26 45.33	1.0113365	1897.76
05/19/2023	03 42 05.026	19 39 56.52	1.0115458	1897.36
05/20/2023	03 46 04.581	19 52 47.62	1.0117504	1896.98
05/21/2023	03 50 04.681	20 05 18.35	1.0119501	1896.60
05/22/2023	03 54 05.314	20 17 28.44	1.0121452	1896.24
05/23/2023	03 58 06.466	20 29 17.64	1.0123355	1895.88
05/24/2023	04 02 08.125	20 40 45.68	1.0125212	1895.53
05/25/2023	04 06 10.278	20 51 52.32	1.0127025	1895.20
05/26/2023	04 10 12.912	21 02 37.32	1.0128795	1894.86
05/27/2023	04 14 16.013	21 13 00.45	1.0130524	1894.54
05/28/2023	04 18 19.569	21 23 01.50	1.0132213	1894.23
05/29/2023	04 22 23.568	21 32 40.26	1.0133864	1893.92

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Date	Right Ascension	Declination	Distance	Diameter
0 h TT	h m s	d m s	au	arc sec
05/30/2023	04 26 27.996	21 41 56.52	1.0135481	1893.61
05/31/2023	04 30 32.843	21 50 50.11	1.0137063	1893.32
06/01/2023	04 34 38.095	21 59 20.85	1.0138614	1893.03
06/02/2023	04 38 43.740	22 07 28.58	1.0140136	1892.75
06/03/2023	04 42 49.766	22 15 13.16	1.0141629	1892.47
06/04/2023	04 46 56.162	22 22 34.44	1.0143096	1892.19
06/05/2023	04 51 02.911	22 29 32.30	1.0144536	1891.92
06/06/2023	04 55 10.000	22 36 06.60	1.0145950	1891.66
06/07/2023	04 59 17.412	22 42 17.21	1.0147336	1891.40
06/08/2023	05 03 25.129	22 48 03.99	1.0148691	1891.15
06/09/2023	05 07 33.135	22 53 26.80	1.0150013	1890.90
06/10/2023	05 11 41.412	22 58 25.52	1.0151298	1890.66
06/11/2023	05 15 49.942	23 03 00.01	1.0152542	1890.43
06/12/2023	05 19 58.705	23 07 10.16	1.0153741	1890.21
06/13/2023	05 24 07.681	23 10 55.87	1.0154892	1889.99
06/14/2023	05 28 16.847	23 14 17.05	1.0155992	1889.79
06/15/2023	05 32 26.178	23 17 13.63	1.0157038	1889.60
06/16/2023	05 36 35.648	23 19 45.54	1.0158028	1889.41
06/17/2023	05 40 45.231	23 21 52.74	1.0158960	1889.24
06/18/2023	05 44 54.896	23 23 35.17	1.0159833	1889.08
06/19/2023	05 49 04.615	23 24 52.80	1.0160648	1888.92
06/20/2023	05 53 14.360	23 25 45.61	1.0161404	1888.78
06/21/2023	05 57 24.102	23 26 13.58	1.0162102	1888.65
06/22/2023	06 01 33.813	23 26 16.71	1.0162742	1888.53
06/23/2023	06 05 43.466	23 25 54.99	1.0163327	1888.43
06/24/2023	06 09 53.036	23 25 08.46	1.0163858	1888.33
06/25/2023	06 14 02.496	23 23 57.14	1.0164336	1888.24
06/26/2023	06 18 11.824	23 22 21.07	1.0164764	1888.16
06/27/2023	06 22 20.997	23 20 20.30	1.0165144	1888.09
06/28/2023	06 26 29.991	23 17 54.91	1.0165478	1888.03
06/29/2023	06 30 38.787	23 15 04.98	1.0165769	1887.97
06/30/2023	06 34 47.363	23 11 50.59	1.0166020	1887.93
07/01/2023	06 38 55.702	23 08 11.86	1.0166233	1887.89
07/02/2023	06 43 03.784	23 04 08.89	1.0166410	1887.85
07/03/2023	06 47 11.590	22 59 41.81	1.0166554	1887.83
07/04/2023	06 51 19.103	22 54 50.75	1.0166666	1887.81
07/05/2023	06 55 26.306	22 49 35.81	1.0166746	1887.79
07/06/2023	06 59 33.180	22 43 57.12	1.0166794	1887.78
07/07/2023	07 03 39.713	22 37 54.78	1.0166806	1887.78
07/08/2023	07 07 45.889	22 31 28.91	1.0166781	1887.78
07/09/2023	07 11 51.695	22 24 39.64	1.0166714	1887.80
07/10/2023	07 15 57.116	22 17 27.12	1.0166604	1887.82
07/11/2023	07 20 02.138	22 09 51.50	1.0166446	1887.85
07/12/2023	07 24 06.744	22 01 52.96	1.0166237	1887.89
07/13/2023	07 28 10.917	21 53 31.69	1.0165975	1887.93
07/14/2023	07 32 14.638	21 44 47.87	1.0165657	1887.99
07/15/2023	07 36 17.890	21 35 41.73	1.0165282	1888.06
07/16/2023	07 40 20.653	21 26 13.47	1.0164848	1888.14
07/17/2023	07 44 22.910	21 16 23.30	1.0164355	1888.24
07/18/2023	07 48 24.644	21 06 11.47	1.0163802	1888.34

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Date	Right Ascension	Declination	Distance	Diameter
0 h TT	h m s	d m s	au	arc sec
07/19/2023	07 52 25.840	20 55 38.19	1.0163190	1888.45
07/20/2023	07 56 26.483	20 44 43.71	1.0162520	1888.58
07/21/2023	08 00 26.560	20 33 28.27	1.0161791	1888.71
07/22/2023	08 04 26.060	20 21 52.11	1.0161006	1888.86
07/23/2023	08 08 24.973	20 09 55.50	1.0160165	1889.01
07/24/2023	08 12 23.290	19 57 38.69	1.0159272	1889.18
07/25/2023	08 16 21.004	19 45 01.95	1.0158328	1889.36
07/26/2023	08 20 18.111	19 32 05.56	1.0157336	1889.54
07/27/2023	08 24 14.605	19 18 49.79	1.0156299	1889.73
07/28/2023	08 28 10.483	19 05 14.93	1.0155219	1889.93
07/29/2023	08 32 05.744	18 51 21.27	1.0154101	1890.14
07/30/2023	08 36 00.387	18 37 09.10	1.0152948	1890.36
07/31/2023	08 39 54.411	18 22 38.71	1.0151762	1890.58
08/01/2023	08 43 47.817	18 07 50.38	1.0150546	1890.80
08/02/2023	08 47 40.608	17 52 44.40	1.0149303	1891.04
08/03/2023	08 51 32.787	17 37 21.00	1.0148033	1891.27
08/04/2023	08 55 24.363	17 21 40.46	1.0146735	1891.51
08/05/2023	08 59 15.344	17 05 43.02	1.0145409	1891.76
08/06/2023	09 03 05.738	16 49 28.93	1.0144051	1892.01
08/07/2023	09 06 55.554	16 32 58.46	1.0142659	1892.27
08/08/2023	09 10 44.799	16 16 11.91	1.0141230	1892.54
08/09/2023	09 14 33.477	15 59 09.56	1.0139761	1892.82
08/10/2023	09 18 21.594	15 41 51.73	1.0138250	1893.10
08/11/2023	09 22 09.152	15 24 18.73	1.0136695	1893.39
08/12/2023	09 25 56.157	15 06 30.87	1.0135093	1893.69
08/13/2023	09 29 42.610	14 48 28.47	1.0133443	1894.00
08/14/2023	09 33 28.517	14 30 11.85	1.0131744	1894.31
08/15/2023	09 37 13.883	14 11 41.35	1.0129996	1894.64
08/16/2023	09 40 58.712	13 52 57.27	1.0128198	1894.98
08/17/2023	09 44 43.012	13 33 59.96	1.0126350	1895.32
08/18/2023	09 48 26.790	13 14 49.74	1.0124453	1895.68
08/19/2023	09 52 10.055	12 55 26.94	1.0122508	1896.04
08/20/2023	09 55 52.816	12 35 51.88	1.0120516	1896.41
08/21/2023	09 59 35.083	12 16 04.90	1.0118478	1896.80
08/22/2023	10 03 16.868	11 56 06.34	1.0116398	1897.19
08/23/2023	10 06 58.183	11 35 56.52	1.0114278	1897.58
08/24/2023	10 10 39.041	11 15 35.78	1.0112119	1897.99
08/25/2023	10 14 19.454	10 55 04.46	1.0109927	1898.40
08/26/2023	10 17 59.436	10 34 22.89	1.0107703	1898.82
08/27/2023	10 21 39.002	10 13 31.41	1.0105453	1899.24
08/28/2023	10 25 18.166	09 52 30.35	1.0103179	1899.67
08/29/2023	10 28 56.943	09 31 20.03	1.0100887	1900.10
08/30/2023	10 32 35.352	09 10 00.75	1.0098578	1900.53
08/31/2023	10 36 13.412	08 48 32.81	1.0096256	1900.97
09/01/2023	10 39 51.146	08 26 56.47	1.0093922	1901.41
09/02/2023	10 43 28.576	08 05 12.00	1.0091575	1901.85
09/03/2023	10 47 05.728	07 43 19.69	1.0089215	1902.30
09/04/2023	10 50 42.624	07 21 19.80	1.0086840	1902.75
09/05/2023	10 54 19.285	06 59 12.64	1.0084448	1903.20
09/06/2023	10 57 55.729	06 36 58.52	1.0082036	1903.65

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0 h TT	h m s	d m s	au	arc sec
09/07/2023	11 01 31.974	06 14 37.77	1.0079602	1904.11
09/08/2023	11 05 08.037	05 52 10.70	1.0077143	1904.58
09/09/2023	11 08 43.933	05 29 37.66	1.0074659	1905.05
09/10/2023	11 12 19.680	05 06 58.97	1.0072147	1905.52
09/11/2023	11 15 55.293	04 44 14.99	1.0069606	1906.00
09/12/2023	11 19 30.788	04 21 26.05	1.0067036	1906.49
09/13/2023	11 23 06.183	03 58 32.49	1.0064435	1906.98
09/14/2023	11 26 41.495	03 35 34.67	1.0061803	1907.48
09/15/2023	11 30 16.740	03 12 32.92	1.0059140	1907.99
09/16/2023	11 33 51.937	02 49 27.60	1.0056446	1908.50
09/17/2023	11 37 27.104	02 26 19.06	1.0053724	1909.01
09/18/2023	11 41 02.258	02 03 07.64	1.0050972	1909.54
09/19/2023	11 44 37.419	01 39 53.70	1.0048195	1910.06
09/20/2023	11 48 12.604	01 16 37.60	1.0045392	1910.60
09/21/2023	11 51 47.832	00 53 19.69	1.0042568	1911.13
09/22/2023	11 55 23.121	00 30 00.33	1.0039726	1911.67
09/23/2023	11 58 58.488	00 06 39.88	1.0036868	1912.22
09/24/2023	12 02 33.953	-00 16 41.31	1.0034000	1912.77
09/25/2023	12 06 09.533	-00 40 02.87	1.0031124	1913.31
09/26/2023	12 09 45.249	-01 03 24.47	1.0028246	1913.86
09/27/2023	12 13 21.123	-01 26 45.77	1.0025369	1914.41
09/28/2023	12 16 57.178	-01 50 06.45	1.0022497	1914.96
09/29/2023	12 20 33.441	-02 13 26.22	1.0019633	1915.51
09/30/2023	12 24 09.939	-02 36 44.77	1.0016778	1916.05
10/01/2023	12 27 46.700	-03 00 01.80	1.0013932	1916.60
10/02/2023	12 31 23.750	-03 23 17.02	1.0011096	1917.14
10/03/2023	12 35 01.113	-03 46 30.11	1.0008269	1917.68
10/04/2023	12 38 38.810	-04 09 40.73	1.0005447	1918.22
10/05/2023	12 42 16.863	-04 32 48.53	1.0002630	1918.76
10/06/2023	12 45 55.291	-04 55 53.15	0.9999816	1919.30
10/07/2023	12 49 34.113	-05 18 54.24	0.9997002	1919.84
10/08/2023	12 53 13.348	-05 41 51.42	0.9994187	1920.39
10/09/2023	12 56 53.013	-06 04 44.31	0.9991370	1920.93
10/10/2023	13 00 33.127	-06 27 32.54	0.9988548	1921.47
10/11/2023	13 04 13.708	-06 50 15.73	0.9985722	1922.01
10/12/2023	13 07 54.774	-07 12 53.47	0.9982891	1922.56
10/13/2023	13 11 36.342	-07 35 25.40	0.9980053	1923.10
10/14/2023	13 15 18.429	-07 57 51.11	0.9977208	1923.65
10/15/2023	13 19 01.051	-08 20 10.21	0.9974357	1924.20
10/16/2023	13 22 44.226	-08 42 22.29	0.9971500	1924.75
10/17/2023	13 26 27.968	-09 04 26.97	0.9968638	1925.31
10/18/2023	13 30 12.292	-09 26 23.84	0.9965773	1925.86
10/19/2023	13 33 57.211	-09 48 12.48	0.9962906	1926.41
10/20/2023	13 37 42.738	-10 09 52.49	0.9960040	1926.97
10/21/2023	13 41 28.885	-10 31 23.46	0.9957180	1927.52
10/22/2023	13 45 15.664	-10 52 44.97	0.9954327	1928.07
10/23/2023	13 49 03.089	-11 13 56.62	0.9951487	1928.63
10/24/2023	13 52 51.172	-11 34 58.00	0.9948664	1929.17
10/25/2023	13 56 39.930	-11 55 48.73	0.9945862	1929.72
10/26/2023	14 00 29.380	-12 16 28.43	0.9943084	1930.25

Sun - Apparent data

Date	Right Ascension	Declination	Distance	Diameter
0 h TT	h m s	d m s	au	arc sec
10/27/2023	14 04 19.541	-12 36 56.72	0.9940336	1930.79
10/28/2023	14 08 10.431	-12 57 13.26	0.9937618	1931.32
10/29/2023	14 12 02.070	-13 17 17.69	0.9934934	1931.84
10/30/2023	14 15 54.475	-13 37 09.65	0.9932283	1932.35
10/31/2023	14 19 47.661	-13 56 48.77	0.9929667	1932.86
11/01/2023	14 23 41.642	-14 16 14.68	0.9927083	1933.37
11/02/2023	14 27 36.428	-14 35 26.99	0.9924531	1933.86
11/03/2023	14 31 32.030	-14 54 25.29	0.9922010	1934.35
11/04/2023	14 35 28.457	-15 13 09.18	0.9919517	1934.84
11/05/2023	14 39 25.716	-15 31 38.25	0.9917051	1935.32
11/06/2023	14 43 23.816	-15 49 52.08	0.9914610	1935.80
11/07/2023	14 47 22.761	-16 07 50.26	0.9912192	1936.27
11/08/2023	14 51 22.558	-16 25 32.37	0.9909797	1936.74
11/09/2023	14 55 23.211	-16 42 57.99	0.9907423	1937.20
11/10/2023	14 59 24.723	-17 00 06.71	0.9905068	1937.66
11/11/2023	15 03 27.095	-17 16 58.12	0.9902732	1938.12
11/12/2023	15 07 30.328	-17 33 31.79	0.9900413	1938.57
11/13/2023	15 11 34.420	-17 49 47.32	0.9898111	1939.03
11/14/2023	15 15 39.369	-18 05 44.29	0.9895827	1939.47
11/15/2023	15 19 45.169	-18 21 22.30	0.9893559	1939.92
11/16/2023	15 23 51.811	-18 36 40.95	0.9891310	1940.36
11/17/2023	15 27 59.286	-18 51 39.81	0.9889082	1940.80
11/18/2023	15 32 07.585	-19 06 18.49	0.9886876	1941.23
11/19/2023	15 36 16.696	-19 20 36.59	0.9884697	1941.66
11/20/2023	15 40 26.608	-19 34 33.73	0.9882547	1942.08
11/21/2023	15 44 37.313	-19 48 09.51	0.9880431	1942.49
11/22/2023	15 48 48.801	-20 01 23.59	0.9878353	1942.90
11/23/2023	15 53 01.067	-20 14 15.60	0.9876317	1943.30
11/24/2023	15 57 14.101	-20 26 45.23	0.9874326	1943.70
11/25/2023	16 01 27.898	-20 38 52.15	0.9872384	1944.08
11/26/2023	16 05 42.450	-20 50 36.07	0.9870493	1944.45
11/27/2023	16 09 57.745	-21 01 56.67	0.9868655	1944.81
11/28/2023	16 14 13.773	-21 12 53.67	0.9866870	1945.16
11/29/2023	16 18 30.519	-21 23 26.76	0.9865140	1945.51
11/30/2023	16 22 47.967	-21 33 35.65	0.9863463	1945.84
12/01/2023	16 27 06.101	-21 43 20.03	0.9861839	1946.16
12/02/2023	16 31 24.903	-21 52 39.62	0.9860266	1946.47
12/03/2023	16 35 44.353	-22 01 34.12	0.9858742	1946.77
12/04/2023	16 40 04.431	-22 10 03.25	0.9857267	1947.06
12/05/2023	16 44 25.114	-22 18 06.73	0.9855837	1947.34
12/06/2023	16 48 46.381	-22 25 44.31	0.9854452	1947.62
12/07/2023	16 53 08.206	-22 32 55.74	0.9853109	1947.88
12/08/2023	16 57 30.565	-22 39 40.76	0.9851807	1948.14
12/09/2023	17 01 53.430	-22 45 59.15	0.9850544	1948.39
12/10/2023	17 06 16.773	-22 51 50.71	0.9849317	1948.63
12/11/2023	17 10 40.564	-22 57 15.23	0.9848126	1948.87
12/12/2023	17 15 04.770	-23 02 12.52	0.9846969	1949.10
12/13/2023	17 19 29.355	-23 06 42.43	0.9845844	1949.32
12/14/2023	17 23 54.282	-23 10 44.79	0.9844752	1949.53
12/15/2023	17 28 19.513	-23 14 19.46	0.9843692	1949.74

Sun - Apparent data

Date	Right Ascension	Declination	Distance	Diameter
0 h TT	h m s	d m s	au	arc sec
12/16/2023	17 32 45.007	-23 17 26.30	0.9842668	1949.95
12/17/2023	17 37 10.725	-23 20 05.20	0.9841679	1950.14
12/18/2023	17 41 36.630	-23 22 16.05	0.9840730	1950.33
12/19/2023	17 46 02.686	-23 23 58.77	0.9839823	1950.51
12/20/2023	17 50 28.860	-23 25 13.29	0.9838963	1950.68
12/21/2023	17 54 55.119	-23 25 59.58	0.9838153	1950.84
12/22/2023	17 59 21.434	-23 26 17.62	0.9837396	1950.99
12/23/2023	18 03 47.772	-23 26 07.42	0.9836696	1951.13
12/24/2023	18 08 14.105	-23 25 28.98	0.9836055	1951.26
12/25/2023	18 12 40.400	-23 24 22.34	0.9835476	1951.37
12/26/2023	18 17 06.626	-23 22 47.55	0.9834959	1951.48
12/27/2023	18 21 32.753	-23 20 44.64	0.9834506	1951.57
12/28/2023	18 25 58.749	-23 18 13.68	0.9834117	1951.64
12/29/2023	18 30 24.584	-23 15 14.73	0.9833791	1951.71
12/30/2023	18 34 50.227	-23 11 47.86	0.9833528	1951.76
12/31/2023	18 39 15.649	-23 07 53.15	0.9833325	1951.80
01/01/2024	18 43 40.819	-23 03 30.70	0.9833183	1951.83
01/02/2024	18 48 05.710	-22 58 40.63	0.9833098	1951.85



Moon - Apparent data

Date	Right Ascension	Declination	Distance	Parallax	Diameter	%Illum.
0 h TT	h m s	d m s	km	arc min	arc sec	
12/31/2022	01 19 29.631	06 24 27.74	384755.024	56.99061	1863.56	60.1
01/01/2023	02 06 36.647	12 02 57.59	389579.972	56.28472	1840.48	69.9
01/02/2023	02 54 33.766	17 04 20.88	393844.376	55.67523	1820.55	78.7
01/03/2023	03 44 01.684	21 17 09.56	397480.791	55.16583	1803.89	86.2
01/04/2023	04 35 17.252	24 30 30.19	400478.319	54.75289	1790.39	92.1
01/05/2023	05 28 07.490	26 34 55.54	402855.383	54.42979	1779.83	96.5
01/06/2023	06 21 49.342	27 23 58.99	404634.531	54.19045	1772.00	99.0
01/07/2023	07 15 19.914	26 55 48.00	405822.636	54.03178	1766.81	99.8
01/08/2023	08 07 35.655	25 13 40.32	406398.800	53.95518	1764.31	98.9
01/09/2023	08 57 51.484	22 25 16.09	406311.189	53.96681	1764.69	96.2
01/10/2023	09 45 50.876	18 40 52.57	405482.913	54.07706	1768.29	91.8
01/11/2023	10 31 45.365	14 11 35.95	403826.022	54.29895	1775.55	86.0
01/12/2023	11 16 08.267	09 08 11.50	401261.924	54.64596	1786.90	78.8
01/13/2023	11 59 47.989	03 40 44.17	397746.058	55.12904	1802.69	70.4
01/14/2023	12 43 43.551	-02 00 55.93	393294.259	55.75311	1823.10	61.1
01/15/2023	13 29 02.277	-07 46 12.32	388007.879	56.51279	1847.93	51.1
01/16/2023	14 16 57.778	-13 22 13.12	382093.818	57.38757	1876.54	40.7
01/17/2023	15 08 44.639	-18 32 08.08	375874.327	58.33724	1907.59	30.3
01/18/2023	16 05 24.251	-22 53 50.18	369779.926	59.29880	1939.02	20.6
01/19/2023	17 07 16.963	-26 00 29.43	364318.449	60.18784	1968.09	12.1
01/20/2023	18 13 27.088	-27 25 03.22	360016.205	60.90716	1991.61	5.4
01/21/2023	19 21 31.380	-26 49 09.11	357335.632	61.36411	2006.55	1.4
01/22/2023	20 28 24.659	-24 11 49.93	356586.547	61.49303	2010.77	0.2
01/23/2023	21 31 40.787	-19 51 00.56	357858.519	61.27444	2003.62	2.2
01/24/2023	22 30 20.906	-14 16 21.73	361000.149	60.74114	1986.18	7.0
01/25/2023	23 24 43.892	-07 59 51.92	365653.881	59.96800	1960.90	14.2
01/26/2023	00 15 51.345	-01 29 35.90	371332.049	59.05091	1930.92	23.1
01/27/2023	01 04 58.499	04 52 13.76	377506.325	58.08502	1899.34	33.1
01/28/2023	01 53 18.191	10 48 38.04	383684.957	57.14957	1868.75	43.5
01/29/2023	02 41 52.958	16 06 16.11	389464.200	56.30145	1841.02	53.8
01/30/2023	03 31 29.632	20 33 56.13	394552.302	55.57533	1817.28	63.7
01/31/2023	04 22 33.596	24 01 45.82	398771.353	54.98728	1798.06	72.8
02/01/2023	05 15 03.190	26 21 17.62	402044.131	54.53963	1783.42	80.9
02/02/2023	06 08 27.978	27 26 24.34	404372.272	54.22560	1773.15	87.7
02/03/2023	07 01 55.333	27 14 36.20	405810.545	54.03339	1766.87	93.2
02/04/2023	07 54 25.902	25 47 52.10	406440.794	53.94960	1764.13	97.0
02/05/2023	08 45 11.763	23 12 28.78	406348.355	53.96187	1764.53	99.3
02/06/2023	09 33 48.710	19 37 51.44	405603.380	54.06099	1767.77	99.8
02/07/2023	10 20 18.949	15 15 02.49	404249.086	54.24212	1773.69	98.5
02/08/2023	11 05 06.882	10 15 27.34	402298.424	54.50515	1782.29	95.4
02/09/2023	11 48 52.866	04 50 16.07	399739.762	54.85406	1793.70	90.7
02/10/2023	12 32 28.219	-00 49 37.91	396551.179	55.29517	1808.12	84.3
02/11/2023	13 16 52.227	-06 33 08.07	392721.824	55.83439	1825.75	76.4
02/12/2023	14 03 10.137	-12 07 59.82	388277.753	56.47350	1846.65	67.3
02/13/2023	14 52 29.755	-17 19 38.29	383308.641	57.20568	1870.59	57.2
02/14/2023	15 45 52.867	-21 49 58.05	377990.616	58.01059	1896.91	46.5
02/15/2023	16 43 57.179	-25 17 02.18	372599.227	58.85007	1924.35	35.7
02/16/2023	17 46 29.119	-27 16 54.35	367505.485	59.66583	1951.02	25.2
02/17/2023	18 52 02.351	-27 28 56.89	363148.287	60.38180	1974.43	15.7
02/18/2023	19 58 10.528	-25 43 23.91	359980.131	60.91327	1991.81	8.1

Moon - Apparent data

Date	Right Ascension	Declination	Distance	Parallax	Diameter	%Illum.
0 h TT	h m s	d m s	km	arc min	arc sec	
02/19/2023	21 02 22.919	-22 06 31.50	358391.330	61.18333	2000.64	2.8
02/20/2023	22 03 03.906	-16 59 19.96	358629.475	61.14270	1999.31	0.3
02/21/2023	22 59 52.331	-10 51 06.06	360739.205	60.78508	1987.62	0.9
02/22/2023	23 53 22.765	-04 12 24.37	364544.619	60.15049	1966.87	4.3
02/23/2023	00 44 36.967	02 29 21.76	369681.054	59.31466	1939.54	10.2
02/24/2023	01 34 42.763	08 51 42.59	375663.392	58.37000	1908.66	18.0
02/25/2023	02 24 41.795	14 36 53.82	381966.924	57.40664	1877.16	27.0
02/26/2023	03 15 21.913	19 31 00.49	388098.777	56.49955	1847.50	36.8
02/27/2023	04 07 10.879	23 23 02.27	393647.852	55.70303	1821.46	46.8
02/28/2023	05 00 11.023	26 04 30.80	398311.337	55.05079	1800.13	56.6
03/01/2023	05 53 57.555	27 29 47.77	401901.692	54.55896	1784.05	66.0
03/02/2023	06 47 44.228	27 36 46.18	404339.754	54.22996	1773.29	74.6
03/03/2023	07 40 36.975	26 27 19.43	405638.940	54.05626	1767.61	82.3
03/04/2023	08 31 50.473	24 07 08.46	405884.177	54.02359	1766.55	88.8
03/05/2023	09 21 00.112	20 44 46.89	405208.141	54.11373	1769.49	94.0
03/06/2023	10 08 05.512	16 30 30.58	403766.893	54.30691	1775.81	97.7
03/07/2023	10 53 27.369	11 35 20.83	401716.994	54.58405	1784.87	99.6
03/08/2023	11 37 41.849	06 10 35.08	399196.464	54.92872	1796.14	99.7
03/09/2023	12 21 35.633	00 27 44.34	396312.023	55.32854	1809.21	97.9
03/10/2023	13 06 02.601	-05 21 08.81	393134.812	55.77573	1823.84	94.1
03/11/2023	13 52 01.458	-11 02 57.37	389705.794	56.26654	1839.88	88.5
03/12/2023	14 40 32.449	-16 22 48.16	386050.605	56.79933	1857.30	81.1
03/13/2023	15 32 30.365	-21 03 23.67	382201.741	57.37137	1876.01	72.2
03/14/2023	16 28 30.810	-24 44 57.07	378224.163	57.97477	1895.73	62.1
03/15/2023	17 28 29.822	-27 06 32.66	374238.822	58.59221	1915.92	51.1
03/16/2023	18 31 26.285	-27 49 39.49	370437.533	59.19352	1935.58	39.9
03/17/2023	19 35 26.644	-26 43 27.25	367082.472	59.73459	1953.27	28.9
03/18/2023	20 38 22.318	-23 49 04.36	364485.035	60.16032	1967.19	18.9
03/19/2023	21 38 38.589	-19 20 02.74	362962.935	60.41263	1975.44	10.5
03/20/2023	22 35 40.294	-13 38 48.64	362781.347	60.44288	1976.43	4.4
03/21/2023	23 29 45.454	-07 11 56.17	364091.942	60.22528	1969.32	0.8
03/22/2023	00 21 43.873	-00 26 17.52	366888.193	59.76623	1954.31	0.2
03/23/2023	01 12 37.141	06 13 15.59	370992.201	59.10501	1932.69	2.2
03/24/2023	02 03 24.874	12 24 58.30	376077.392	58.30574	1906.56	6.7
03/25/2023	02 54 55.198	17 50 34.16	381718.606	57.44399	1878.38	13.2
03/26/2023	03 47 36.815	22 15 17.84	387453.628	56.59363	1850.58	21.1
03/27/2023	04 41 32.366	25 28 02.36	392840.768	55.81748	1825.20	30.0
03/28/2023	05 36 15.915	27 21 42.67	397502.986	55.16275	1803.79	39.5
03/29/2023	06 30 58.628	27 53 45.11	401155.659	54.66043	1787.37	49.1
03/30/2023	07 24 43.344	27 06 13.24	403619.471	54.32674	1776.46	58.6
03/31/2023	08 16 42.370	25 05 07.67	404821.597	54.16541	1771.18	67.7
04/01/2023	09 06 30.140	21 59 08.67	404788.262	54.16987	1771.33	76.2
04/02/2023	09 54 06.570	17 58 14.94	403630.928	54.32520	1776.41	83.7
04/03/2023	10 39 53.294	13 12 49.66	401527.524	54.60981	1785.71	90.2
04/04/2023	11 24 27.444	07 53 23.95	398699.837	54.99715	1798.38	95.2
04/05/2023	12 08 36.315	02 10 51.48	395388.357	55.45780	1813.44	98.5
04/06/2023	12 53 13.829	-03 42 58.14	391826.674	55.96196	1829.92	99.9
04/07/2023	13 39 18.038	-09 34 38.26	388218.469	56.48213	1846.93	99.3
04/08/2023	14 27 47.739	-15 08 26.37	384720.846	56.99567	1863.72	96.5
04/09/2023	15 19 35.530	-20 06 01.95	381437.481	57.48633	1879.76	91.5

Moon - Apparent data

Date	Right Ascension	Declination	Distance	Parallax	Diameter	%Illum.
0 h TT	h m s	d m s	km	arc min	arc sec	
04/10/2023	16 15 14.555	-24 06 47.27	378423.648	57.94420	1894.74	84.5
04/11/2023	17 14 39.365	-26 49 31.98	375702.513	58.36392	1908.46	75.8
04/12/2023	18 16 50.072	-27 56 10.66	373289.100	58.74130	1920.80	65.6
04/13/2023	19 19 57.658	-27 16 27.48	371215.786	59.06941	1931.52	54.5
04/14/2023	20 21 59.374	-24 51 18.92	369552.032	59.33537	1940.22	43.1
04/15/2023	21 21 24.461	-20 52 36.51	368411.597	59.51907	1946.23	31.9
04/16/2023	22 17 38.618	-15 39 38.37	367942.965	59.59488	1948.71	21.6
04/17/2023	23 10 58.895	-09 35 05.59	368302.856	59.53664	1946.80	12.8
04/18/2023	00 02 14.236	-03 02 16.47	369617.856	59.32480	1939.87	6.1
04/19/2023	00 52 26.881	03 36 12.12	371943.901	58.95376	1927.74	1.8
04/20/2023	01 42 39.305	09 58 56.19	375235.357	58.43659	1910.83	0.0
04/21/2023	02 33 44.767	15 46 05.44	379333.154	57.80526	1890.19	0.8
04/22/2023	03 26 18.546	20 39 54.39	383975.379	57.10634	1867.34	4.0
04/23/2023	04 20 29.159	24 25 34.24	388826.711	56.39376	1844.04	9.1
04/24/2023	05 15 52.645	26 52 25.89	393518.377	55.72136	1822.06	15.8
04/25/2023	06 11 35.708	27 55 13.29	397689.574	55.13687	1802.95	23.7
04/26/2023	07 06 30.823	27 34 35.77	401023.551	54.67844	1787.96	32.5
04/27/2023	07 59 37.963	25 56 25.29	403274.916	54.37316	1777.98	41.7
04/28/2023	08 50 21.769	23 09 58.66	404287.506	54.23697	1773.52	51.2
04/29/2023	09 38 37.080	19 25 56.05	404003.607	54.27508	1774.77	60.6
04/30/2023	10 24 44.675	14 54 55.48	402465.633	54.48251	1781.55	69.6
05/01/2023	11 09 23.429	09 47 02.70	399810.965	54.84429	1793.38	78.1
05/02/2023	11 53 23.573	04 12 08.96	396260.039	55.33580	1809.45	85.6
05/03/2023	12 37 42.502	-01 39 19.80	392097.401	55.92331	1828.66	91.9
05/04/2023	13 23 22.322	-07 35 17.60	387645.704	56.56559	1849.66	96.6
05/05/2023	14 11 27.020	-13 20 51.10	383233.756	57.21686	1870.95	99.4
05/06/2023	15 02 56.152	-18 37 30.04	379161.757	57.83139	1891.05	99.9
05/07/2023	15 58 31.427	-23 03 10.29	375669.123	58.36911	1908.63	98.0
05/08/2023	16 58 15.126	-26 14 02.75	372911.715	58.80075	1922.74	93.7
05/09/2023	18 01 08.996	-27 48 50.39	370954.445	59.11103	1932.89	87.0
05/10/2023	19 05 15.018	-27 34 44.75	369781.714	59.29851	1939.02	78.4
05/11/2023	20 08 13.219	-25 31 49.75	369322.944	59.37218	1941.42	68.2
05/12/2023	21 08 16.405	-21 52 38.44	369485.758	59.34602	1940.57	57.1
05/13/2023	22 04 41.524	-16 57 33.22	370187.245	59.23355	1936.89	45.6
05/14/2023	22 57 44.613	-11 09 27.77	371374.794	59.04412	1930.70	34.4
05/15/2023	23 48 17.996	-04 50 32.66	373031.547	58.78186	1922.12	24.0
05/16/2023	00 37 29.125	01 38 43.44	375166.070	58.44738	1911.19	15.1
05/17/2023	01 26 26.918	07 59 17.87	377790.164	58.04137	1897.91	8.1
05/18/2023	02 16 12.979	13 53 02.33	380891.706	57.56871	1882.46	3.1
05/19/2023	03 07 33.640	19 02 32.76	384410.476	57.04169	1865.23	0.5
05/20/2023	04 00 50.644	23 11 42.24	388223.654	56.48137	1846.91	0.2
05/21/2023	04 55 52.178	26 07 04.69	392144.615	55.91658	1828.44	2.0
05/22/2023	05 51 50.510	27 39 51.98	395934.873	55.38125	1810.94	5.8
05/23/2023	06 47 32.949	27 47 31.90	399325.982	54.91090	1795.56	11.3
05/24/2023	07 41 44.993	26 34 02.08	402046.715	54.53928	1783.41	18.1
05/25/2023	08 33 33.905	24 08 18.23	403851.051	54.29559	1775.44	26.1
05/26/2023	09 22 40.514	20 41 44.49	404543.668	54.20262	1772.40	34.8
05/27/2023	10 09 17.441	16 26 00.70	404001.080	54.27542	1774.78	44.0
05/28/2023	10 54 00.416	11 31 51.31	402187.512	54.52019	1782.78	53.6
05/29/2023	11 37 39.642	06 08 58.47	399165.002	54.93305	1796.28	63.1

Moon - Apparent data

Date	Right Ascension	Declination	Distance	Parallax	Diameter	%Illum.
0 h TT	h m s	d m s	km	arc min	arc sec	
05/30/2023	12 21 14.209	00 26 42.53	395096.958	55.49871	1814.78	72.3
05/31/2023	13 05 49.336	-05 24 47.40	390243.764	56.18897	1837.35	80.8
06/01/2023	13 52 34.517	-11 13 05.48	384948.457	56.96197	1862.62	88.3
06/02/2023	14 42 39.401	-16 41 59.43	379610.515	57.76302	1888.81	94.2
06/03/2023	15 37 02.976	-21 30 31.05	374647.239	58.52833	1913.83	98.2
06/04/2023	16 36 11.909	-25 13 31.33	370445.474	59.19225	1935.54	99.9
06/05/2023	17 39 31.405	-27 25 16.51	367311.183	59.69739	1952.06	98.9
06/06/2023	18 45 09.692	-27 46 26.40	365428.420	60.00500	1962.11	95.2
06/07/2023	19 50 25.646	-26 11 25.56	364839.707	60.10183	1965.28	88.9
06/08/2023	20 52 54.553	-22 50 43.34	365454.521	60.00071	1961.97	80.5
06/09/2023	21 51 21.160	-18 06 19.00	367083.401	59.73444	1953.27	70.4
06/10/2023	22 45 45.365	-12 24 17.85	369486.574	59.34588	1940.56	59.4
06/11/2023	23 36 56.547	-06 09 28.47	372422.601	58.87798	1925.27	48.0
06/12/2023	00 26 05.820	00 16 37.91	375684.974	58.36665	1908.55	36.9
06/13/2023	01 14 28.205	06 35 32.59	379120.502	57.83769	1891.25	26.7
06/14/2023	02 03 12.857	12 30 43.99	382629.355	57.30724	1873.91	17.7
06/15/2023	02 53 16.003	17 46 38.51	386150.940	56.78457	1856.82	10.4
06/16/2023	03 45 12.822	22 08 21.39	389641.882	56.27577	1840.18	5.0
06/17/2023	04 39 07.933	25 22 18.01	393052.732	55.78738	1824.22	1.5
06/18/2023	05 34 28.942	27 17 56.34	396309.087	55.32895	1809.23	0.2
06/19/2023	06 30 10.782	27 49 54.03	399300.980	54.91434	1795.67	0.8
06/20/2023	07 24 54.577	26 59 17.92	401882.189	54.56161	1784.14	3.3
06/21/2023	08 17 33.506	24 53 15.88	403878.995	54.29183	1775.32	7.6
06/22/2023	09 07 31.430	21 42 50.39	405106.408	54.12732	1769.94	13.4
06/23/2023	09 54 46.867	17 40 24.80	405389.132	54.08957	1768.70	20.4
06/24/2023	10 39 46.226	12 57 50.87	404584.591	54.19714	1772.22	28.5
06/25/2023	11 23 14.311	07 45 42.71	402605.706	54.46355	1780.93	37.4
06/26/2023	12 06 07.157	02 13 28.40	399441.636	54.89500	1795.04	46.9
06/27/2023	12 49 28.295	-03 29 38.12	395174.760	55.48778	1814.42	56.7
06/28/2023	13 34 27.186	-09 13 17.94	389991.875	56.22526	1838.53	66.5
06/29/2023	14 22 17.288	-14 44 29.96	384186.706	57.07492	1866.31	75.9
06/30/2023	15 14 09.800	-19 45 52.50	378149.882	57.98616	1896.11	84.4
07/01/2023	16 10 57.708	-23 54 48.69	372342.257	58.89069	1925.68	91.6
07/02/2023	17 12 47.067	-26 44 46.28	367249.124	59.70748	1952.39	96.8
07/03/2023	18 18 26.090	-27 50 35.26	363317.832	60.35362	1973.51	99.5
07/04/2023	19 25 24.318	-26 57 11.90	360889.094	60.75983	1986.79	99.4
07/05/2023	20 30 46.231	-24 06 43.64	360139.679	60.88628	1990.93	96.4
07/06/2023	21 32 26.287	-19 38 01.22	361055.411	60.73184	1985.88	90.7
07/07/2023	22 29 44.230	-13 59 17.08	363444.771	60.33253	1972.82	82.6
07/08/2023	23 23 09.567	-07 39 56.01	366988.290	59.74992	1953.77	72.8
07/09/2023	00 13 48.374	-01 05 52.73	371306.280	59.05501	1931.05	62.1
07/10/2023	01 02 57.730	05 21 36.95	376024.179	58.31399	1906.83	51.0
07/11/2023	01 51 51.557	11 25 06.58	380820.576	57.57946	1882.81	40.1
07/12/2023	02 41 32.538	16 49 36.71	385452.170	56.88752	1860.19	30.0
07/13/2023	03 32 44.913	21 21 32.77	389757.363	56.25910	1839.64	21.0
07/14/2023	04 25 46.057	24 48 34.76	393644.057	55.70357	1821.48	13.3
07/15/2023	05 20 19.163	27 00 32.04	397068.276	55.22315	1805.77	7.3
07/16/2023	06 15 33.343	27 51 06.58	400009.675	54.81704	1792.49	3.1
07/17/2023	07 10 16.670	27 19 30.04	402448.898	54.48477	1781.63	0.7
07/18/2023	08 03 19.226	25 30 47.02	404350.456	54.22852	1773.25	0.2

Moon - Apparent data

Date	Right Ascension	Declination	Distance	Parallax	Diameter	%Illum.
0 h TT	h m s	d m s	km	arc min	arc sec	
07/19/2023	08 53 54.317	22 34 39.81	405653.441	54.05432	1767.55	1.6
07/20/2023	09 41 47.661	18 43 15.80	406270.985	53.97215	1764.86	4.7
07/21/2023	10 27 14.426	14 09 03.64	406098.128	53.99513	1765.62	9.4
07/22/2023	11 10 50.814	09 03 39.24	405026.773	54.13796	1770.29	15.5
07/23/2023	11 53 26.250	03 37 26.71	402965.804	54.41488	1779.34	23.0
07/24/2023	12 35 58.604	-01 59 57.56	399864.191	54.83699	1793.14	31.5
07/25/2023	13 19 32.102	-07 38 50.36	395734.772	55.40925	1811.85	40.9
07/26/2023	14 05 16.169	-13 08 04.41	390676.205	56.12677	1835.31	50.9
07/27/2023	14 54 22.326	-18 13 36.57	384889.901	56.97064	1862.90	61.2
07/28/2023	15 47 54.805	-22 37 03.32	378687.681	57.90380	1893.41	71.3
07/29/2023	16 46 30.049	-25 55 20.24	372484.614	58.86818	1924.95	80.7
07/30/2023	17 49 46.139	-27 43 04.84	366771.102	59.78531	1954.93	88.9
07/31/2023	18 56 00.956	-27 38 59.83	362060.556	60.56322	1980.37	95.1
08/01/2023	20 02 32.094	-25 34 26.19	358815.731	61.11096	1998.27	98.9
08/02/2023	21 06 42.761	-21 38 20.94	357367.457	61.35864	2006.37	99.7
08/03/2023	22 07 03.545	-16 14 33.68	357849.121	61.27605	2003.67	97.5
08/04/2023	23 03 25.261	-09 53 59.98	360170.534	60.88106	1990.76	92.5
08/05/2023	23 56 33.744	-03 07 25.89	364041.789	60.23358	1969.59	85.0
08/06/2023	00 47 39.091	03 38 27.79	369037.687	59.41808	1942.92	75.8
08/07/2023	01 37 54.846	10 02 00.67	374679.182	58.52334	1913.67	65.5
08/08/2023	02 28 26.141	15 45 48.92	380507.552	57.62683	1884.36	54.8
08/09/2023	03 20 01.466	20 35 35.88	386136.365	56.78671	1856.89	44.2
08/10/2023	04 13 04.774	24 19 27.94	391277.519	56.04050	1832.49	34.2
08/11/2023	05 07 28.662	26 48 03.10	395745.089	55.40781	1811.81	25.0
08/12/2023	06 02 33.328	27 55 30.11	399443.536	54.89474	1795.03	17.0
08/13/2023	06 57 16.337	27 40 40.84	402346.730	54.49861	1782.08	10.4
08/14/2023	07 50 32.194	26 07 39.77	404473.096	54.21208	1772.71	5.4
08/15/2023	08 41 32.585	23 24 58.41	405860.974	54.02668	1766.65	2.0
08/16/2023	09 29 57.445	19 43 54.03	406547.378	53.93546	1763.66	0.3
08/17/2023	10 15 54.713	15 16 42.55	406552.623	53.93476	1763.64	0.5
08/18/2023	10 59 53.600	10 15 23.71	405872.529	54.02514	1766.60	2.4
08/19/2023	11 42 37.141	04 51 09.43	404479.078	54.21128	1772.68	6.1
08/20/2023	12 24 56.994	-00 45 31.59	402329.454	54.50095	1782.15	11.4
08/21/2023	13 07 50.761	-06 24 22.58	399382.457	54.90314	1795.30	18.2
08/22/2023	13 52 20.671	-11 54 27.55	395620.470	55.42526	1812.38	26.3
08/23/2023	14 39 31.526	-17 03 05.38	391074.456	56.06961	1833.44	35.6
08/24/2023	15 30 24.878	-21 34 40.67	385848.755	56.82905	1858.27	45.7
08/25/2023	16 25 45.621	-25 10 02.38	380141.460	57.68234	1886.17	56.4
08/26/2023	17 25 39.481	-27 27 13.06	374254.955	58.58969	1915.84	67.0
08/27/2023	18 29 09.817	-28 05 04.18	368589.991	59.49026	1945.28	77.2
08/28/2023	19 34 16.572	-26 49 36.49	363616.726	60.30400	1971.89	86.2
08/29/2023	20 38 35.056	-23 40 07.38	359819.406	60.94048	1992.70	93.4
08/30/2023	21 40 14.232	-18 50 50.19	357619.422	61.31541	2004.96	98.1
08/31/2023	22 38 30.451	-12 47 06.96	357293.097	61.37142	2006.79	99.9
09/01/2023	23 33 41.640	-05 59 19.46	358909.501	61.09499	1997.75	98.6
09/02/2023	00 26 42.105	01 02 22.90	362311.469	60.52127	1978.99	94.5
09/03/2023	01 18 38.891	07 51 05.30	367147.358	59.72403	1952.93	87.9
09/04/2023	02 10 35.746	14 04 15.51	372940.750	58.79617	1922.59	79.5
09/05/2023	03 03 22.089	19 23 42.37	379173.280	57.82964	1890.99	69.9
09/06/2023	03 57 23.808	23 35 13.94	385357.527	56.90150	1860.64	59.7

Moon - Apparent data

Date	Right Ascension	Declination	Distance	Parallax	Diameter	%Illum.
0 h TT	h m s	d m s	km	arc min	arc sec	
09/07/2023	04 52 36.038	26 28 34.53	391087.254	56.06777	1833.38	49.4
09/08/2023	05 48 21.933	27 57 53.55	396062.940	55.36334	1810.35	39.5
09/09/2023	06 43 42.010	28 02 23.06	400096.799	54.80511	1792.10	30.2
09/10/2023	07 37 33.021	26 46 20.35	403103.420	54.39630	1778.73	21.8
09/11/2023	08 29 07.667	24 18 10.74	405081.506	54.13065	1770.05	14.5
09/12/2023	09 18 05.644	20 48 49.61	406090.905	53.99609	1765.65	8.5
09/13/2023	10 04 33.716	16 30 07.21	406228.077	53.97785	1765.05	4.0
09/14/2023	10 48 59.302	11 33 47.05	405602.534	54.06111	1767.77	1.1
09/15/2023	11 32 03.119	06 11 03.43	404316.647	54.23306	1773.40	0.1
09/16/2023	12 14 33.824	00 32 48.45	402451.056	54.48448	1781.62	0.8
09/17/2023	12 57 25.046	-05 10 02.83	400057.661	54.81047	1792.27	3.5
09/18/2023	13 41 33.767	-10 45 56.08	397161.434	55.21020	1805.34	7.9
09/19/2023	14 27 58.313	-16 01 54.41	393771.272	55.68557	1820.89	14.1
09/20/2023	15 17 33.585	-20 42 55.88	389898.755	56.23869	1838.97	21.9
09/21/2023	16 11 00.779	-24 31 31.30	385582.295	56.86832	1859.56	31.1
09/22/2023	17 08 30.489	-27 08 21.99	380912.798	57.56552	1882.35	41.3
09/23/2023	18 09 24.522	-28 14 45.89	376055.700	58.30910	1906.67	52.2
09/24/2023	19 12 11.720	-27 36 58.71	371263.113	59.06188	1931.28	63.3
09/25/2023	20 14 52.473	-25 10 51.86	366869.275	59.76931	1954.41	73.9
09/26/2023	21 15 43.454	-21 04 02.27	363263.557	60.36263	1973.81	83.6
09/27/2023	22 13 51.925	-15 34 22.89	360839.393	60.76820	1987.07	91.4
09/28/2023	23 09 20.569	-09 06 23.67	359925.477	60.92252	1992.11	97.0
09/29/2023	00 02 51.263	-02 07 31.77	360715.222	60.78912	1987.75	99.7
09/30/2023	00 55 24.552	04 54 33.00	363216.455	60.37046	1974.06	99.5
10/01/2023	01 48 03.031	11 33 50.44	367239.351	59.70907	1952.44	96.5
10/02/2023	02 41 38.389	17 27 16.69	372426.861	58.87731	1925.24	91.1
10/03/2023	03 36 39.811	22 15 41.69	378315.913	57.96071	1895.27	83.7
10/04/2023	04 33 04.036	25 44 44.75	384409.135	57.04189	1865.23	75.1
10/05/2023	05 30 11.878	27 45 55.45	390238.825	56.18968	1837.37	65.6
10/06/2023	06 26 57.294	28 17 17.63	395412.984	55.45435	1813.33	55.8
10/07/2023	07 22 08.699	27 23 14.70	399641.383	54.86756	1794.14	46.0
10/08/2023	08 14 52.187	25 12 57.09	402744.564	54.44477	1780.32	36.5
10/09/2023	09 04 44.523	21 58 06.53	404650.160	54.18835	1771.93	27.7
10/10/2023	09 51 52.844	17 50 56.33	405380.483	54.09072	1768.74	19.7
10/11/2023	10 36 46.708	13 03 04.57	405034.279	54.13696	1770.25	12.7
10/12/2023	11 20 09.315	07 45 20.94	403764.693	54.30720	1775.82	7.1
10/13/2023	12 02 51.313	02 08 09.63	401755.148	54.57886	1784.70	2.9
10/14/2023	12 45 47.437	-03 37 50.22	399195.102	54.92891	1796.15	0.6
10/15/2023	13 29 54.745	-09 20 58.37	396258.144	55.33606	1809.46	0.1
10/16/2023	14 16 10.532	-14 47 49.83	393085.372	55.78274	1824.06	1.6
10/17/2023	15 05 27.604	-19 42 42.77	389776.958	56.25627	1839.55	5.2
10/18/2023	15 58 24.432	-23 47 36.39	386393.949	56.74886	1855.65	10.7
10/19/2023	16 55 09.439	-26 43 10.62	382970.676	57.25617	1872.24	18.1
10/20/2023	17 55 04.766	-28 11 20.68	379535.840	57.77439	1889.18	27.1
10/21/2023	18 56 43.414	-27 59 16.58	376138.075	58.29633	1906.25	37.4
10/22/2023	19 58 12.425	-26 03 09.51	372869.970	58.80733	1922.96	48.5
10/23/2023	20 57 54.006	-22 29 28.45	369883.643	59.28217	1938.48	59.8
10/24/2023	21 54 57.358	-17 33 09.78	367391.301	59.68437	1951.63	70.8
10/25/2023	22 49 24.147	-11 34 21.90	365646.378	59.96923	1960.94	80.8
10/26/2023	23 41 54.652	-04 55 45.07	364905.179	60.09105	1964.93	89.2

Moon - Apparent data

Date	Right Ascension	Declination	Distance	Parallax	Diameter	%Illum.
0 h TT	h m s	d m s	km	arc min	arc sec	
10/27/2023	00 33 29.523	01 58 56.19	365375.270	60.01373	1962.40	95.4
10/28/2023	01 25 14.760	08 45 36.57	367163.220	59.72145	1952.84	99.0
10/29/2023	02 18 09.541	15 00 30.46	370237.223	59.22555	1936.63	100.0
10/30/2023	03 12 53.971	20 21 17.13	374416.714	58.56437	1915.01	98.3
10/31/2023	04 09 35.885	24 28 43.53	379392.057	57.79629	1889.90	94.2
11/01/2023	05 07 41.416	27 08 59.50	384767.306	56.98879	1863.50	88.2
11/02/2023	06 05 58.698	28 15 45.69	390113.241	56.20777	1837.96	80.7
11/03/2023	07 02 59.687	27 51 01.43	395018.226	55.50977	1815.14	72.2
11/04/2023	07 57 30.619	26 03 42.01	399128.841	54.93803	1796.45	63.0
11/05/2023	08 48 53.075	23 06 38.55	402177.375	54.52156	1782.83	53.6
11/06/2023	09 37 06.962	19 13 34.44	403996.781	54.27600	1774.80	44.1
11/07/2023	10 22 41.173	14 37 10.55	404525.230	54.20509	1772.48	34.9
11/08/2023	11 06 21.867	09 28 31.91	403802.373	54.30213	1775.65	26.2
11/09/2023	11 49 03.999	03 57 32.47	401958.771	54.55121	1783.80	18.2
11/10/2023	12 31 46.866	-01 46 09.41	399199.222	54.92834	1796.13	11.4
11/11/2023	13 15 32.175	-07 32 02.96	395780.481	55.40285	1811.64	5.9
11/12/2023	14 01 22.347	-13 07 36.37	391984.211	55.93946	1829.19	2.1
11/13/2023	14 50 16.345	-18 17 20.42	388087.167	56.50124	1847.56	0.2
11/14/2023	15 42 59.902	-22 42 28.46	384332.147	57.05332	1865.61	0.5
11/15/2023	16 39 48.365	-26 01 53.32	380904.613	57.56676	1882.39	3.0
11/16/2023	17 40 06.750	-27 55 05.74	377920.112	58.02141	1897.26	7.9
11/17/2023	18 42 22.697	-28 07 06.86	375426.006	58.40691	1909.86	14.8
11/18/2023	19 44 29.722	-26 33 11.78	373417.691	58.72107	1920.14	23.6
11/19/2023	20 44 34.600	-23 20 18.75	371865.361	58.96622	1928.15	33.9
11/20/2023	21 41 36.099	-18 44 26.97	370744.132	59.14456	1933.98	45.0
11/21/2023	22 35 32.344	-13 06 04.57	370059.055	59.25407	1937.56	56.4
11/22/2023	23 27 04.830	-06 46 39.51	369857.654	59.28634	1938.62	67.5
11/23/2023	00 17 17.913	-00 07 13.12	370225.700	59.22739	1936.69	77.7
11/24/2023	01 07 23.320	06 31 39.48	371266.312	59.06137	1931.26	86.4
11/25/2023	01 58 29.283	12 49 20.92	373067.166	58.77624	1921.94	93.2
11/26/2023	02 51 30.136	18 25 04.06	375664.444	58.36984	1908.65	97.7
11/27/2023	03 46 53.309	22 58 41.16	379013.650	57.85399	1891.79	99.8
11/28/2023	04 44 25.371	26 12 49.14	382975.618	57.25543	1872.22	99.5
11/29/2023	05 43 06.063	27 55 52.06	387321.351	56.61296	1851.21	96.9
11/30/2023	06 41 21.643	28 04 39.89	391753.761	55.97237	1830.26	92.4
12/01/2023	07 37 36.868	26 44 54.70	395940.289	55.38049	1810.91	86.4
12/02/2023	08 30 47.113	24 08 48.50	399549.169	54.88023	1794.56	79.0
12/03/2023	09 20 31.926	20 31 17.61	402283.351	54.50720	1782.36	70.7
12/04/2023	10 07 09.221	16 06 54.19	403908.483	54.28787	1775.19	61.7
12/05/2023	10 51 21.637	11 08 13.56	404273.619	54.23883	1773.58	52.4
12/06/2023	11 34 04.818	05 45 47.42	403324.591	54.36647	1777.76	43.0
12/07/2023	12 16 20.677	00 08 49.92	401110.396	54.66660	1787.57	33.8
12/08/2023	12 59 14.649	-05 33 29.59	397782.543	55.12398	1802.53	25.0
12/09/2023	13 43 54.556	-11 10 41.28	393586.635	55.71169	1821.74	16.9
12/10/2023	14 31 28.196	-16 29 27.41	388844.947	56.39112	1843.96	10.1
12/11/2023	15 22 55.960	-21 12 32.70	383928.919	57.11325	1867.57	4.7
12/12/2023	16 18 54.664	-24 58 36.52	379221.930	57.82222	1890.75	1.3
12/13/2023	17 19 12.904	-27 24 17.54	375075.569	58.46149	1911.65	0.1
12/14/2023	18 22 31.162	-28 09 21.14	371766.385	58.98192	1928.66	1.5
12/15/2023	19 26 32.248	-27 03 27.33	369462.875	59.34969	1940.69	5.5

Moon - Apparent data

Date	Right Ascension	Declination	Distance	Parallax	Diameter	%Illum.
0 h TT	h m s	d m s	km	arc min	arc sec	
12/16/2023	20 28 51.495	-24 10 27.28	368212.101	59.55132	1947.28	11.8
12/17/2023	21 27 53.533	-19 46 49.30	367950.567	59.59365	1948.66	20.3
12/18/2023	22 23 14.353	-14 15 50.46	368536.353	59.49892	1945.57	30.3
12/19/2023	23 15 26.984	-08 01 56.99	369792.702	59.29675	1938.96	41.3
12/20/2023	00 05 35.722	-01 27 44.24	371550.405	59.01621	1929.79	52.6
12/21/2023	00 54 56.024	05 06 34.62	373678.306	58.68011	1918.80	63.7
12/22/2023	01 44 42.188	11 22 22.57	376096.088	58.30284	1906.46	74.0
12/23/2023	02 35 58.278	17 01 40.12	378769.024	57.89136	1893.01	82.9
12/24/2023	03 29 27.611	21 46 41.82	381688.674	57.44849	1878.53	90.2
12/25/2023	04 25 19.480	25 20 44.43	384846.229	56.97710	1863.12	95.5
12/26/2023	05 22 58.147	27 30 21.07	388206.014	56.48394	1846.99	98.7
12/27/2023	06 21 05.251	28 08 21.98	391685.765	55.98209	1830.58	99.8
12/28/2023	07 18 02.886	27 15 58.98	395148.034	55.49153	1814.54	98.8
12/29/2023	08 12 27.823	25 02 16.28	398404.013	55.03799	1799.71	95.9
12/30/2023	09 03 35.829	21 41 15.50	401228.250	54.65054	1787.05	91.3
12/31/2023	09 51 25.240	17 28 22.14	403380.916	54.35887	1777.51	85.3
01/01/2024	10 36 26.317	12 37 53.65	404633.750	54.19055	1772.01	78.0
01/02/2024	11 19 28.084	07 21 58.61	404796.305	54.16879	1771.29	69.8



## Mercury - Apparent data

Date 0 h TT	Right Ascension			Declination			Earth	Solar	Equatorial	Mag.	Phase Angle deg.
	h	m	s	d	m	s	Distance au	Distance au	Diameter arc sec		
12/31/2022	19	43	36.262	-20	44	55.00	0.7699889	0.3100854	8.74	0.9	127.4
01/01/2023	19	41	38.980	-20	30	21.34	0.7491483	0.3085967	8.98	1.4	134.0
01/02/2023	19	38	52.136	-20	17	19.01	0.7301794	0.3077329	9.22	1.9	140.8
01/03/2023	19	35	18.053	-20	05	55.28	0.7134007	0.3075081	9.43	2.5	147.7
01/04/2023	19	31	01.105	-19	56	14.24	0.6991031	0.3079259	9.63	3.2	154.7
01/05/2023	19	26	07.785	-19	48	16.87	0.6875318	0.3089795	9.79	4.0	161.4
01/06/2023	19	20	46.529	-19	42	01.59	0.6788705	0.3106518	9.91	4.9	167.5
01/07/2023	19	15	07.297	-19	37	25.04	0.6732286	0.3129164	10.00	5.4	171.2
01/08/2023	19	09	20.937	-19	34	22.83	0.6706340	0.3157389	10.04	5.2	169.7
01/09/2023	19	03	38.416	-19	32	50.27	0.6710330	0.3190778	10.03	4.5	164.7
01/10/2023	18	58	10.057	-19	32	42.67	0.6742972	0.3228869	9.98	3.8	158.6
01/11/2023	18	53	04.893	-19	33	55.38	0.6802350	0.3271164	9.89	3.1	152.3
01/12/2023	18	48	30.230	-19	36	23.57	0.6886085	0.3317144	9.77	2.5	146.1
01/13/2023	18	44	31.450	-19	40	01.90	0.6991496	0.3366287	9.63	2.0	140.2
01/14/2023	18	41	12.039	-19	44	44.29	0.7115768	0.3418076	9.46	1.6	134.5
01/15/2023	18	38	33.770	-19	50	23.75	0.7256087	0.3472009	9.27	1.2	129.1
01/16/2023	18	36	36.990	-19	56	52.48	0.7409748	0.3527607	9.08	1.0	124.0
01/17/2023	18	35	20.933	-20	04	01.98	0.7574226	0.3584419	8.89	0.7	119.1
01/18/2023	18	34	44.033	-20	11	43.30	0.7747224	0.3642023	8.69	0.5	114.6
01/19/2023	18	34	44.186	-20	19	47.31	0.7926693	0.3700029	8.49	0.4	110.3
01/20/2023	18	35	18.977	-20	28	04.93	0.8110834	0.3758080	8.30	0.3	106.3
01/21/2023	18	36	25.844	-20	36	27.33	0.8298091	0.3815850	8.11	0.2	102.5
01/22/2023	18	38	02.203	-20	44	46.11	0.8487131	0.3873045	7.93	0.1	98.9
01/23/2023	18	40	05.538	-20	52	53.37	0.8676829	0.3929398	7.76	0.1	95.5
01/24/2023	18	42	33.455	-21	00	41.79	0.8866237	0.3984671	7.59	0.0	92.3
01/25/2023	18	45	23.715	-21	08	04.66	0.9054569	0.4038648	7.43	-0.0	89.3
01/26/2023	18	48	34.250	-21	14	55.90	0.9241176	0.4091139	7.28	-0.0	86.4
01/27/2023	18	52	03.162	-21	21	10.03	0.9425527	0.4141974	7.14	-0.1	83.7
01/28/2023	18	55	48.726	-21	26	42.12	0.9607190	0.4191000	7.01	-0.1	81.2
01/29/2023	18	59	49.376	-21	31	27.78	0.9785818	0.4238084	6.88	-0.1	78.8
01/30/2023	19	04	03.694	-21	35	23.09	0.9961134	0.4283106	6.76	-0.1	76.5
01/31/2023	19	08	30.404	-21	38	24.58	1.0132923	0.4325961	6.64	-0.1	74.3
02/01/2023	19	13	08.352	-21	40	29.14	1.0301016	0.4366557	6.53	-0.1	72.2
02/02/2023	19	17	56.501	-21	41	34.04	1.0465288	0.4404811	6.43	-0.1	70.2
02/03/2023	19	22	53.915	-21	41	36.85	1.0625647	0.4440650	6.33	-0.1	68.3
02/04/2023	19	27	59.752	-21	40	35.42	1.0782028	0.4474013	6.24	-0.1	66.5
02/05/2023	19	33	13.254	-21	38	27.84	1.0934389	0.4504844	6.15	-0.1	64.8
02/06/2023	19	38	33.735	-21	35	12.45	1.1082706	0.4533095	6.07	-0.1	63.2
02/07/2023	19	44	00.579	-21	30	47.75	1.1226971	0.4558723	5.99	-0.1	61.6
02/08/2023	19	49	33.230	-21	25	12.42	1.1367183	0.4581692	5.92	-0.1	60.0
02/09/2023	19	55	11.183	-21	18	25.32	1.1503354	0.4601972	5.85	-0.1	58.6
02/10/2023	20	00	53.986	-21	10	25.43	1.1635499	0.4619537	5.78	-0.1	57.2
02/11/2023	20	06	41.227	-21	01	11.85	1.1763638	0.4634364	5.72	-0.1	55.8
02/12/2023	20	12	32.537	-20	50	43.81	1.1887794	0.4646436	5.66	-0.1	54.5
02/13/2023	20	18	27.579	-20	39	00.63	1.2007988	0.4655739	5.60	-0.1	53.2
02/14/2023	20	24	26.051	-20	26	01.72	1.2124245	0.4662261	5.55	-0.1	51.9
02/15/2023	20	30	27.678	-20	11	46.58	1.2236583	0.4665995	5.50	-0.2	50.7
02/16/2023	20	36	32.214	-19	56	14.78	1.2345022	0.4666937	5.45	-0.2	49.4
02/17/2023	20	42	39.434	-19	39	25.97	1.2449575	0.4665086	5.41	-0.2	48.2
02/18/2023	20	48	49.137	-19	21	19.83	1.2550253	0.4660444	5.36	-0.2	47.0

## Mercury - Apparent data

Date 0 h TT	Right Ascension			Declination			Earth	Solar	Equatorial	Mag.	Phase Angle deg.
	h	m	s	d	m	s	Distance au	Distance au	Diameter arc sec		
02/19/2023	20	55	01.144	-19	01	56.12	1.2647060	0.4653017	5.32	-0.2	45.8
02/20/2023	21	01	15.297	-18	41	14.63	1.2739997	0.4642812	5.28	-0.2	44.6
02/21/2023	21	07	31.459	-18	19	15.17	1.2829057	0.4629841	5.25	-0.2	43.4
02/22/2023	21	13	49.514	-17	55	57.61	1.2914225	0.4614121	5.21	-0.3	42.2
02/23/2023	21	20	09.368	-17	31	21.84	1.2995479	0.4595669	5.18	-0.3	40.9
02/24/2023	21	26	30.940	-17	05	27.79	1.3072788	0.4574509	5.15	-0.3	39.7
02/25/2023	21	32	54.169	-16	38	15.43	1.3146107	0.4550670	5.12	-0.4	38.4
02/26/2023	21	39	19.007	-16	09	44.74	1.3215382	0.4524182	5.09	-0.4	37.1
02/27/2023	21	45	45.421	-15	39	55.75	1.3280543	0.4495085	5.07	-0.4	35.7
02/28/2023	21	52	13.391	-15	08	48.52	1.3341508	0.4463422	5.04	-0.5	34.3
03/01/2023	21	58	42.910	-14	36	23.13	1.3398178	0.4429244	5.02	-0.5	32.9
03/02/2023	22	05	13.985	-14	02	39.70	1.3450435	0.4392607	5.00	-0.6	31.5
03/03/2023	22	11	46.633	-13	27	38.40	1.3498146	0.4353579	4.99	-0.6	30.0
03/04/2023	22	18	20.881	-12	51	19.45	1.3541155	0.4312234	4.97	-0.7	28.4
03/05/2023	22	24	56.770	-12	13	43.12	1.3579287	0.4268658	4.96	-0.8	26.8
03/06/2023	22	31	34.345	-11	34	49.75	1.3612343	0.4222947	4.94	-0.8	25.2
03/07/2023	22	38	13.664	-10	54	39.77	1.3640099	0.4175211	4.93	-0.9	23.5
03/08/2023	22	44	54.787	-10	13	13.71	1.3662305	0.4125573	4.93	-1.0	21.7
03/09/2023	22	51	37.782	-09	30	32.23	1.3678686	0.4074175	4.92	-1.1	19.9
03/10/2023	22	58	22.718	-08	46	36.15	1.3688934	0.4021173	4.92	-1.2	18.0
03/11/2023	23	05	09.662	-08	01	26.46	1.3692713	0.3966743	4.92	-1.3	16.1
03/12/2023	23	11	58.679	-07	15	04.38	1.3689656	0.3911086	4.92	-1.4	14.1
03/13/2023	23	18	49.827	-06	27	31.39	1.3679363	0.3854423	4.92	-1.5	12.0
03/14/2023	23	25	43.151	-05	38	49.29	1.3661405	0.3797001	4.93	-1.6	9.9
03/15/2023	23	32	38.678	-04	49	00.25	1.3635320	0.3739097	4.94	-1.8	7.8
03/16/2023	23	39	36.411	-03	58	06.90	1.3600620	0.3681015	4.95	-1.9	5.8
03/17/2023	23	46	36.324	-03	06	12.34	1.3556792	0.3623091	4.96	-2.0	4.4
03/18/2023	23	53	38.353	-02	13	20.29	1.3503303	0.3565694	4.98	-2.0	4.4
03/19/2023	00	00	42.386	-01	19	35.12	1.3439612	0.3509223	5.01	-2.0	5.9
03/20/2023	00	07	48.258	-00	25	01.95	1.3365175	0.3454111	5.04	-2.0	8.4
03/21/2023	00	14	55.736	00	30	13.28	1.3279457	0.3400819	5.07	-1.9	11.2
03/22/2023	00	22	04.513	01	26	03.68	1.3181956	0.3349835	5.11	-1.8	14.4
03/23/2023	00	29	14.190	02	22	21.43	1.3072211	0.3301666	5.15	-1.8	17.7
03/24/2023	00	36	24.270	03	18	57.65	1.2949832	0.3256832	5.20	-1.7	21.3
03/25/2023	00	43	34.147	04	15	42.40	1.2814518	0.3215856	5.25	-1.6	25.0
03/26/2023	00	50	43.098	05	12	24.73	1.2666085	0.3179251	5.31	-1.5	28.9
03/27/2023	00	57	50.279	06	08	52.70	1.2504486	0.3147506	5.38	-1.5	32.9
03/28/2023	01	04	54.728	07	04	53.53	1.2329838	0.3121070	5.46	-1.4	37.1
03/29/2023	01	11	55.366	08	00	13.72	1.2142437	0.3100335	5.54	-1.3	41.4
03/30/2023	01	18	51.013	08	54	39.35	1.1942773	0.3085621	5.64	-1.3	45.8
03/31/2023	01	25	40.398	09	47	56.26	1.1731529	0.3077161	5.74	-1.2	50.2
04/01/2023	01	32	22.182	10	39	50.37	1.1509582	0.3075095	5.85	-1.1	54.7
04/02/2023	01	38	54.981	11	30	07.99	1.1277983	0.3079455	5.97	-1.1	59.2
04/03/2023	01	45	17.389	12	18	36.07	1.1037937	0.3090170	6.10	-1.0	63.7
04/04/2023	01	51	28.005	13	05	02.46	1.0790771	0.3107067	6.24	-0.9	68.3
04/05/2023	01	57	25.454	13	49	16.06	1.0537898	0.3129882	6.39	-0.8	72.7
04/06/2023	02	03	08.409	14	31	07.00	1.0280783	0.3158265	6.55	-0.7	77.2
04/07/2023	02	08	35.603	15	10	26.65	1.0020905	0.3191803	6.72	-0.6	81.6
04/08/2023	02	13	45.847	15	47	07.64	0.9759725	0.3230030	6.90	-0.5	86.0
04/09/2023	02	18	38.033	16	21	03.74	0.9498662	0.3272448	7.09	-0.4	90.3

## Mercury - Apparent data

Date	Right Ascension	Declination	Earth Distance	Solar Distance	Equatorial Diameter	Mag.	Phase Angle
0 h TT	h m s	d m s	au	au	arc sec		deg.
04/10/2023	02 23 11.141	16 52 09.83	0.9239066	0.3318539	7.28	-0.2	94.5
04/11/2023	02 27 24.242	17 20 21.68	0.8982209	0.3367779	7.49	-0.1	98.7
04/12/2023	02 31 16.502	17 45 35.90	0.8729273	0.3419652	7.71	0.1	102.8
04/13/2023	02 34 47.184	18 07 49.72	0.8481350	0.3473655	7.94	0.2	106.9
04/14/2023	02 37 55.652	18 27 00.93	0.8239437	0.3529311	8.17	0.4	110.9
04/15/2023	02 40 41.382	18 43 07.75	0.8004445	0.3586167	8.41	0.6	114.8
04/16/2023	02 43 03.967	18 56 08.80	0.7777203	0.3643803	8.65	0.8	118.8
04/17/2023	02 45 03.132	19 06 03.09	0.7558462	0.3701830	8.90	1.0	122.7
04/18/2023	02 46 38.749	19 12 50.03	0.7348908	0.3759892	9.16	1.3	126.6
04/19/2023	02 47 50.852	19 16 29.54	0.7149162	0.3817662	9.41	1.5	130.4
04/20/2023	02 48 39.659	19 17 02.15	0.6959792	0.3874848	9.67	1.8	134.3
04/21/2023	02 49 05.590	19 14 29.18	0.6781312	0.3931183	9.92	2.1	138.1
04/22/2023	02 49 09.283	19 08 52.98	0.6614190	0.3986430	10.18	2.4	141.9
04/23/2023	02 48 51.621	19 00 17.12	0.6458845	0.4040374	10.42	2.8	145.7
04/24/2023	02 48 13.733	18 48 46.69	0.6315650	0.4092824	10.66	3.1	149.5
04/25/2023	02 47 17.012	18 34 28.58	0.6184929	0.4143612	10.88	3.5	153.3
04/26/2023	02 46 03.108	18 17 31.65	0.6066955	0.4192586	11.09	4.0	157.0
04/27/2023	02 44 33.918	17 58 06.97	0.5961946	0.4239612	11.29	4.4	160.8
04/28/2023	02 42 51.563	17 36 27.88	0.5870061	0.4284571	11.46	4.9	164.5
04/29/2023	02 40 58.361	17 12 50.04	0.5791397	0.4327360	11.62	5.4	168.2
04/30/2023	02 38 56.780	16 47 31.27	0.5725985	0.4367884	11.75	5.9	171.9
05/01/2023	02 36 49.388	16 20 51.32	0.5673787	0.4406063	11.86	6.5	175.5
05/02/2023	02 34 38.801	15 53 11.51	0.5634698	0.4441825	11.94	6.9	178.4
05/03/2023	02 32 27.622	15 24 54.27	0.5608543	0.4475107	12.00	6.6	176.6
05/04/2023	02 30 18.384	14 56 22.58	0.5595083	0.4505854	12.03	6.1	173.3
05/05/2023	02 28 13.497	14 27 59.40	0.5594017	0.4534019	12.03	5.6	169.8
05/06/2023	02 26 15.201	14 00 07.05	0.5604988	0.4559559	12.01	5.1	166.4
05/07/2023	02 24 25.531	13 33 06.72	0.5627592	0.4582439	11.96	4.7	163.0
05/08/2023	02 22 46.285	13 07 17.95	0.5661385	0.4602629	11.89	4.3	159.7
05/09/2023	02 21 19.014	12 42 58.28	0.5705895	0.4620101	11.79	3.9	156.5
05/10/2023	02 20 05.013	12 20 22.97	0.5760627	0.4634835	11.68	3.6	153.3
05/11/2023	02 19 05.328	11 59 44.89	0.5825074	0.4646812	11.55	3.3	150.2
05/12/2023	02 18 20.767	11 41 14.45	0.5898728	0.4656020	11.41	3.0	147.2
05/13/2023	02 17 51.918	11 24 59.69	0.5981082	0.4662446	11.25	2.7	144.3
05/14/2023	02 17 39.174	11 11 06.41	0.6071645	0.4666084	11.08	2.5	141.4
05/15/2023	02 17 42.756	10 59 38.33	0.6169938	0.4666930	10.91	2.3	138.6
05/16/2023	02 18 02.739	10 50 37.37	0.6275506	0.4664983	10.72	2.1	135.8
05/17/2023	02 18 39.075	10 44 03.81	0.6387914	0.4660246	10.54	1.9	133.2
05/18/2023	02 19 31.621	10 39 56.58	0.6506756	0.4652722	10.34	1.7	130.5
05/19/2023	02 20 40.158	10 38 13.48	0.6631650	0.4642422	10.15	1.6	128.0
05/20/2023	02 22 04.410	10 38 51.34	0.6762241	0.4629357	9.95	1.4	125.5
05/21/2023	02 23 44.066	10 41 46.28	0.6898200	0.4613542	9.76	1.3	123.0
05/22/2023	02 25 38.791	10 46 53.82	0.7039223	0.4594998	9.56	1.2	120.6
05/23/2023	02 27 48.242	10 54 09.04	0.7185025	0.4573746	9.37	1.0	118.2
05/24/2023	02 30 12.079	11 03 26.72	0.7335347	0.4549816	9.17	0.9	115.9
05/25/2023	02 32 49.971	11 14 41.38	0.7489945	0.4523240	8.99	0.8	113.6
05/26/2023	02 35 41.608	11 27 47.43	0.7648590	0.4494055	8.80	0.7	111.3
05/27/2023	02 38 46.700	11 42 39.16	0.7811070	0.4462307	8.62	0.7	109.0
05/28/2023	02 42 04.989	11 59 10.82	0.7977181	0.4428045	8.44	0.6	106.8
05/29/2023	02 45 36.246	12 17 16.63	0.8146727	0.4391328	8.26	0.5	104.6

## Mercury - Apparent data

Date	Right Ascension	Declination	Earth Distance	Solar Distance	Equatorial Diameter	Mag.	Phase Angle
0 h TT	h m s	d m s	au	au	arc sec		deg.
05/30/2023	02 49 20.277	12 36 50.83	0.8319516	0.4352222	8.09	0.4	102.4
05/31/2023	02 53 16.925	12 57 47.64	0.8495359	0.4310803	7.92	0.3	100.2
06/01/2023	02 57 26.067	13 20 01.31	0.8674064	0.4267156	7.76	0.3	97.9
06/02/2023	03 01 47.619	13 43 26.05	0.8855434	0.4221378	7.60	0.2	95.7
06/03/2023	03 06 21.536	14 07 56.08	0.9039260	0.4173579	7.45	0.1	93.5
06/04/2023	03 11 07.803	14 33 25.53	0.9225323	0.4123884	7.30	0.0	91.2
06/05/2023	03 16 06.443	14 59 48.49	0.9413382	0.4072433	7.15	-0.0	88.9
06/06/2023	03 21 17.511	15 26 58.89	0.9603176	0.4019385	7.01	-0.1	86.6
06/07/2023	03 26 41.088	15 54 50.52	0.9794415	0.3964917	6.87	-0.2	84.2
06/08/2023	03 32 17.285	16 23 16.96	0.9986776	0.3909227	6.74	-0.2	81.8
06/09/2023	03 38 06.235	16 52 11.54	1.0179901	0.3852540	6.61	-0.3	79.3
06/10/2023	03 44 08.091	17 21 27.31	1.0373386	0.3795104	6.49	-0.4	76.7
06/11/2023	03 50 23.015	17 50 57.00	1.0566781	0.3737195	6.37	-0.4	74.0
06/12/2023	03 56 51.177	18 20 32.94	1.0759581	0.3679119	6.25	-0.5	71.2
06/13/2023	04 03 32.737	18 50 07.03	1.0951225	0.3621212	6.15	-0.6	68.4
06/14/2023	04 10 27.841	19 19 30.71	1.1141088	0.3563845	6.04	-0.7	65.4
06/15/2023	04 17 36.601	19 48 34.90	1.1328478	0.3507419	5.94	-0.7	62.3
06/16/2023	04 24 59.083	20 17 09.97	1.1512636	0.3452364	5.85	-0.8	59.1
06/17/2023	04 32 35.292	20 45 05.76	1.1692735	0.3399145	5.76	-0.9	55.7
06/18/2023	04 40 25.148	21 12 11.55	1.1867885	0.3348249	5.67	-1.0	52.2
06/19/2023	04 48 28.468	21 38 16.16	1.2037136	0.3300184	5.59	-1.1	48.6
06/20/2023	04 56 44.950	22 03 07.97	1.2199492	0.3255469	5.52	-1.1	44.9
06/21/2023	05 05 14.146	22 26 35.08	1.2353923	0.3214629	5.45	-1.2	41.0
06/22/2023	05 13 55.450	22 48 25.48	1.2499389	0.3178173	5.38	-1.3	37.1
06/23/2023	05 22 48.085	23 08 27.25	1.2634863	0.3146591	5.33	-1.4	33.1
06/24/2023	05 31 51.092	23 26 28.79	1.2759359	0.3120329	5.27	-1.5	28.9
06/25/2023	05 41 03.334	23 42 19.14	1.2871964	0.3099777	5.23	-1.6	24.8
06/26/2023	05 50 23.507	23 55 48.27	1.2971869	0.3085253	5.19	-1.8	20.6
06/27/2023	05 59 50.155	24 06 47.34	1.3058400	0.3076987	5.15	-1.9	16.4
06/28/2023	06 09 21.702	24 15 09.03	1.3131041	0.3075115	5.13	-2.0	12.3
06/29/2023	06 18 56.490	24 20 47.68	1.3189453	0.3079666	5.10	-2.2	8.4
06/30/2023	06 28 32.816	24 23 39.49	1.3233487	0.3090567	5.09	-2.3	5.2
07/01/2023	06 38 08.981	24 23 42.59	1.3263180	0.3107643	5.07	-2.3	4.1
07/02/2023	06 47 43.332	24 20 56.97	1.3278751	0.3130624	5.07	-2.2	6.4
07/03/2023	06 57 14.296	24 15 24.46	1.3280581	0.3159161	5.07	-2.0	9.7
07/04/2023	07 06 40.420	24 07 08.51	1.3269190	0.3192839	5.07	-1.9	13.2
07/05/2023	07 16 00.390	23 56 13.99	1.3245213	0.3231191	5.08	-1.7	16.8
07/06/2023	07 25 13.050	23 42 46.94	1.3209371	0.3273719	5.09	-1.5	20.2
07/07/2023	07 34 17.407	23 26 54.37	1.3162438	0.3319903	5.11	-1.4	23.6
07/08/2023	07 43 12.637	23 08 43.95	1.3105224	0.3369221	5.14	-1.3	26.8
07/09/2023	07 51 58.068	22 48 23.86	1.3038546	0.3421157	5.16	-1.2	29.8
07/10/2023	08 00 33.180	22 26 02.55	1.2963210	0.3475210	5.19	-1.1	32.8
07/11/2023	08 08 57.581	22 01 48.57	1.2879999	0.3530901	5.23	-1.0	35.6
07/12/2023	08 17 10.999	21 35 50.46	1.2789661	0.3587782	5.26	-0.9	38.3
07/13/2023	08 25 13.260	21 08 16.61	1.2692899	0.3645431	5.30	-0.8	40.8
07/14/2023	08 33 04.277	20 39 15.21	1.2590368	0.3703461	5.35	-0.7	43.3
07/15/2023	08 40 44.034	20 08 54.15	1.2482673	0.3761516	5.39	-0.7	45.6
07/16/2023	08 48 12.572	19 37 21.02	1.2370369	0.3819272	5.44	-0.6	47.8
07/17/2023	08 55 29.976	19 04 43.07	1.2253956	0.3876436	5.49	-0.5	50.0
07/18/2023	09 02 36.368	18 31 07.21	1.2133891	0.3932743	5.55	-0.5	52.0

## Mercury - Apparent data

Date 0 h TT	Right Ascension			Declination			Earth	Solar	Equatorial	Mag.	Phase Angle deg.
	h	m	s	d	m	s	Distance au	Distance au	Diameter arc sec		
07/19/2023	09	09	31.894	17	56	40.00	1.2010580	0.3987955	5.60	-0.4	54.0
07/20/2023	09	16	16.715	17	21	27.69	1.1884389	0.4041860	5.66	-0.4	55.9
07/21/2023	09	22	51.006	16	45	36.19	1.1755644	0.4094267	5.72	-0.3	57.7
07/22/2023	09	29	14.942	16	09	11.14	1.1624633	0.4145006	5.79	-0.3	59.4
07/23/2023	09	35	28.697	15	32	17.89	1.1491613	0.4193928	5.86	-0.2	61.1
07/24/2023	09	41	32.440	14	55	01.56	1.1356810	0.4240900	5.93	-0.2	62.8
07/25/2023	09	47	26.329	14	17	27.05	1.1220425	0.4285801	6.00	-0.2	64.4
07/26/2023	09	53	10.509	13	39	39.05	1.1082634	0.4328529	6.07	-0.1	66.0
07/27/2023	09	58	45.108	13	01	42.11	1.0943593	0.4368991	6.15	-0.1	67.6
07/28/2023	10	04	10.235	12	23	40.62	1.0803442	0.4407106	6.23	-0.1	69.1
07/29/2023	10	09	25.979	11	45	38.87	1.0662305	0.4442801	6.31	-0.0	70.6
07/30/2023	10	14	32.404	11	07	41.04	1.0520293	0.4476015	6.40	-0.0	72.1
07/31/2023	10	19	29.547	10	29	51.28	1.0377508	0.4506692	6.49	0.0	73.6
08/01/2023	10	24	17.423	09	52	13.67	1.0234042	0.4534786	6.58	0.0	75.2
08/02/2023	10	28	56.014	09	14	52.28	1.0089982	0.4560253	6.67	0.1	76.7
08/03/2023	10	33	25.277	08	37	51.18	0.9945410	0.4583059	6.77	0.1	78.2
08/04/2023	10	37	45.138	08	01	14.47	0.9800403	0.4603173	6.87	0.1	79.8
08/05/2023	10	41	55.490	07	25	06.31	0.9655041	0.4620569	6.97	0.1	81.4
08/06/2023	10	45	56.191	06	49	30.98	0.9509401	0.4635225	7.08	0.2	83.0
08/07/2023	10	49	47.060	06	14	32.89	0.9363566	0.4647124	7.19	0.2	84.7
08/08/2023	10	53	27.875	05	40	16.63	0.9217625	0.4656251	7.30	0.2	86.4
08/09/2023	10	56	58.371	05	06	47.01	0.9071674	0.4662597	7.42	0.2	88.1
08/10/2023	11	00	18.237	04	34	09.07	0.8925823	0.4666153	7.54	0.3	89.9
08/11/2023	11	03	27.119	04	02	28.17	0.8780192	0.4666917	7.66	0.3	91.7
08/12/2023	11	06	24.611	03	31	49.95	0.8634922	0.4664887	7.79	0.3	93.6
08/13/2023	11	09	10.263	03	02	20.43	0.8490172	0.4660065	7.93	0.3	95.5
08/14/2023	11	11	43.576	02	34	06.03	0.8346125	0.4652457	8.06	0.4	97.5
08/15/2023	11	14	04.001	02	07	13.59	0.8202990	0.4642071	8.20	0.4	99.6
08/16/2023	11	16	10.946	01	41	50.43	0.8061007	0.4628920	8.35	0.5	101.7
08/17/2023	11	18	03.775	01	18	04.35	0.7920453	0.4613019	8.50	0.5	103.9
08/18/2023	11	19	41.810	00	56	03.69	0.7781643	0.4594388	8.65	0.6	106.2
08/19/2023	11	21	04.346	00	35	57.32	0.7644939	0.4573050	8.80	0.6	108.5
08/20/2023	11	22	10.653	00	17	54.62	0.7510750	0.4549033	8.96	0.7	111.0
08/21/2023	11	22	59.993	00	02	05.48	0.7379541	0.4522370	9.12	0.8	113.5
08/22/2023	11	23	31.637	-00	11	19.79	0.7251840	0.4493100	9.28	0.9	116.2
08/23/2023	11	23	44.890	-00	22	10.53	0.7128240	0.4461266	9.44	1.0	119.0
08/24/2023	11	23	39.114	-00	30	15.94	0.7009402	0.4426920	9.60	1.1	121.9
08/25/2023	11	23	13.773	-00	35	25.27	0.6896068	0.4390120	9.76	1.3	124.9
08/26/2023	11	22	28.466	-00	37	28.12	0.6789053	0.4350933	9.91	1.4	128.1
08/27/2023	11	21	22.984	-00	36	14.84	0.6689255	0.4309434	10.06	1.6	131.4
08/28/2023	11	19	57.362	-00	31	37.06	0.6597651	0.4265709	10.20	1.9	134.8
08/29/2023	11	18	11.940	-00	23	28.23	0.6515293	0.4219857	10.33	2.1	138.4
08/30/2023	11	16	07.431	-00	11	44.34	0.6443297	0.4171987	10.44	2.4	142.2
08/31/2023	11	13	44.973	00	03	35.38	0.6382836	0.4122226	10.54	2.7	146.1
09/01/2023	11	11	06.190	00	22	27.70	0.6335121	0.4070713	10.62	3.1	150.1
09/02/2023	11	08	13.220	00	44	44.72	0.6301372	0.4017608	10.68	3.5	154.2
09/03/2023	11	05	08.737	01	10	13.30	0.6282801	0.3963090	10.71	4.0	158.3
09/04/2023	11	01	55.936	01	38	34.80	0.6280570	0.3907358	10.72	4.5	162.4
09/05/2023	10	58	38.493	02	09	24.95	0.6295763	0.3850636	10.69	4.9	166.2
09/06/2023	10	55	20.486	02	42	14.25	0.6329344	0.3793175	10.63	5.3	169.0

## Mercury - Apparent data

Date 0 h TT	Right Ascension			Declination			Earth	Solar	Equatorial	Mag.	Phase Angle deg.
	h	m	s	d	m	s	Distance au	Distance au	Diameter arc sec		
09/07/2023	10	52	06.294	03	16	28.58	0.6382123	0.3735251	10.55	5.4	169.8
09/08/2023	10	49	00.457	03	51	30.28	0.6454720	0.3677172	10.43	5.2	168.1
09/09/2023	10	46	07.529	04	26	39.44	0.6547539	0.3619275	10.28	4.7	164.5
09/10/2023	10	43	31.919	05	01	15.36	0.6660741	0.3561932	10.10	4.1	160.0
09/11/2023	10	41	17.739	05	34	38.01	0.6794230	0.3505543	9.91	3.5	154.9
09/12/2023	10	39	28.675	06	06	09.38	0.6947644	0.3450544	9.69	2.9	149.6
09/13/2023	10	38	07.875	06	35	14.63	0.7120357	0.3397396	9.45	2.4	144.1
09/14/2023	10	37	17.873	07	01	22.90	0.7311481	0.3346589	9.20	1.9	138.5
09/15/2023	10	37	00.552	07	24	07.88	0.7519880	0.3298631	8.95	1.4	132.9
09/16/2023	10	37	17.121	07	43	08.08	0.7744184	0.3254042	8.69	1.0	127.1
09/17/2023	10	38	08.138	07	58	06.82	0.7982811	0.3213344	8.43	0.7	121.4
09/18/2023	10	39	33.539	08	08	52.19	0.8233991	0.3177048	8.17	0.4	115.6
09/19/2023	10	41	32.689	08	15	16.74	0.8495796	0.3145641	7.92	0.1	109.9
09/20/2023	10	44	04.451	08	17	17.25	0.8766171	0.3119567	7.68	-0.1	104.2
09/21/2023	10	47	07.252	08	14	54.35	0.9042980	0.3099214	7.44	-0.3	98.5
09/22/2023	10	50	39.162	08	08	12.22	0.9324043	0.3084897	7.22	-0.5	92.9
09/23/2023	10	54	37.978	07	57	18.19	0.9607188	0.3076844	7.01	-0.6	87.5
09/24/2023	10	59	01.299	07	42	22.36	0.9890296	0.3075184	6.80	-0.7	82.1
09/25/2023	11	03	46.612	07	23	37.17	1.0171352	0.3079946	6.62	-0.8	76.9
09/26/2023	11	08	51.363	07	01	16.97	1.0448483	0.3091051	6.44	-0.9	71.8
09/27/2023	11	14	13.029	06	35	37.55	1.0719998	0.3108321	6.28	-0.9	66.9
09/28/2023	11	19	49.176	06	06	55.66	1.0984412	0.3131484	6.13	-1.0	62.2
09/29/2023	11	25	37.507	05	35	28.61	1.1240462	0.3160189	5.99	-1.0	57.6
09/30/2023	11	31	35.897	05	01	33.81	1.1487114	0.3194019	5.86	-1.0	53.3
10/01/2023	11	37	42.418	04	25	28.45	1.1723557	0.3232506	5.74	-1.1	49.2
10/02/2023	11	43	55.348	03	47	29.18	1.1949193	0.3275150	5.63	-1.1	45.3
10/03/2023	11	50	13.178	03	07	51.88	1.2163616	0.3321434	5.53	-1.1	41.6
10/04/2023	11	56	34.604	02	26	51.49	1.2366591	0.3370834	5.44	-1.1	38.0
10/05/2023	12	02	58.518	01	44	41.90	1.2558031	0.3422834	5.36	-1.1	34.7
10/06/2023	12	09	23.995	01	01	35.85	1.2737971	0.3476936	5.28	-1.2	31.6
10/07/2023	12	15	50.276	00	17	45.00	1.2906542	0.3532661	5.21	-1.2	28.6
10/08/2023	12	22	16.748	-00	26	40.14	1.3063956	0.3589562	5.15	-1.2	25.8
10/09/2023	12	28	42.928	-01	11	30.09	1.3210478	0.3647219	5.09	-1.2	23.1
10/10/2023	12	35	08.446	-01	56	36.38	1.3346416	0.3705245	5.04	-1.3	20.6
10/11/2023	12	41	33.027	-02	41	51.46	1.3472104	0.3763286	5.00	-1.3	18.2
10/12/2023	12	47	56.475	-03	27	08.59	1.3587890	0.3821020	4.95	-1.3	16.0
10/13/2023	12	54	18.665	-04	12	21.81	1.3694129	0.3878153	4.91	-1.3	13.9
10/14/2023	13	00	39.527	-04	57	25.82	1.3791174	0.3934422	4.88	-1.4	11.8
10/15/2023	13	06	59.034	-05	42	15.92	1.3879369	0.3989590	4.85	-1.4	9.9
10/16/2023	13	13	17.200	-06	26	47.93	1.3959050	0.4043445	4.82	-1.4	8.1
10/17/2023	13	19	34.067	-07	10	58.14	1.4030537	0.4095797	4.80	-1.5	6.4
10/18/2023	13	25	49.699	-07	54	43.23	1.4094132	0.4146478	4.78	-1.5	4.8
10/19/2023	13	32	04.181	-08	38	00.24	1.4150124	0.4195339	4.76	-1.5	3.3
10/20/2023	13	38	17.607	-09	20	46.50	1.4198780	0.4242245	4.74	-1.6	2.1
10/21/2023	13	44	30.086	-10	02	59.58	1.4240349	0.4287079	4.73	-1.5	1.8
10/22/2023	13	50	41.731	-10	44	37.31	1.4275062	0.4329737	4.71	-1.5	2.5
10/23/2023	13	56	52.660	-11	25	37.67	1.4303132	0.4370128	4.71	-1.4	3.8
10/24/2023	14	03	02.998	-12	05	58.84	1.4324753	0.4408169	4.70	-1.3	5.1
10/25/2023	14	09	12.868	-12	45	39.10	1.4340103	0.4443790	4.69	-1.2	6.4
10/26/2023	14	15	22.398	-13	24	36.89	1.4349340	0.4476928	4.69	-1.2	7.7

## Mercury - Apparent data

Date 0 h TT	Right Ascension			Declination			Earth	Solar	Equatorial	Mag.	Phase Angle deg.
	h	m	s	d	m	s	Distance au	Distance au	Diameter arc sec		
10/27/2023	14	21	31.711	-14	02	50.72	1.4352607	0.4507530	4.69	-1.1	9.0
10/28/2023	14	27	40.932	-14	40	19.19	1.4350031	0.4535546	4.69	-1.0	10.4
10/29/2023	14	33	50.178	-15	17	00.99	1.4341721	0.4560936	4.69	-1.0	11.7
10/30/2023	14	39	59.561	-15	52	54.81	1.4327774	0.4583664	4.70	-0.9	12.9
10/31/2023	14	46	09.184	-16	27	59.39	1.4308269	0.4603700	4.70	-0.8	14.2
11/01/2023	14	52	19.143	-17	02	13.50	1.4283274	0.4621018	4.71	-0.8	15.5
11/02/2023	14	58	29.525	-17	35	35.88	1.4252843	0.4635595	4.72	-0.8	16.7
11/03/2023	15	04	40.406	-18	08	05.31	1.4217016	0.4647416	4.73	-0.7	17.9
11/04/2023	15	10	51.855	-18	39	40.54	1.4175824	0.4656466	4.75	-0.7	19.2
11/05/2023	15	17	03.928	-19	10	20.33	1.4129286	0.4662733	4.76	-0.6	20.4
11/06/2023	15	23	16.670	-19	40	03.41	1.4077409	0.4666212	4.78	-0.6	21.6
11/07/2023	15	29	30.113	-20	08	48.53	1.4020191	0.4666899	4.80	-0.6	22.8
11/08/2023	15	35	44.276	-20	36	34.39	1.3957621	0.4664792	4.82	-0.6	24.0
11/09/2023	15	41	59.160	-21	03	19.69	1.3889677	0.4659893	4.85	-0.5	25.2
11/10/2023	15	48	14.754	-21	29	03.12	1.3816329	0.4652209	4.87	-0.5	26.5
11/11/2023	15	54	31.024	-21	53	43.33	1.3737537	0.4641748	4.90	-0.5	27.7
11/12/2023	16	00	47.918	-22	17	18.96	1.3653253	0.4628523	4.93	-0.5	28.9
11/13/2023	16	07	05.361	-22	39	48.65	1.3563423	0.4612548	4.96	-0.5	30.2
11/14/2023	16	13	23.252	-23	01	11.00	1.3467984	0.4593843	5.00	-0.5	31.5
11/15/2023	16	19	41.462	-23	21	24.61	1.3366867	0.4572433	5.03	-0.5	32.8
11/16/2023	16	25	59.834	-23	40	28.06	1.3259996	0.4548344	5.08	-0.5	34.1
11/17/2023	16	32	18.175	-23	58	19.95	1.3147291	0.4521611	5.12	-0.5	35.5
11/18/2023	16	38	36.256	-24	14	58.84	1.3028668	0.4492271	5.17	-0.5	36.9
11/19/2023	16	44	53.809	-24	30	23.33	1.2904037	0.4460369	5.22	-0.5	38.4
11/20/2023	16	51	10.521	-24	44	32.02	1.2773307	0.4425956	5.27	-0.5	39.9
11/21/2023	16	57	26.033	-24	57	23.54	1.2636388	0.4389090	5.33	-0.5	41.6
11/22/2023	17	03	39.930	-25	08	56.59	1.2493187	0.4349839	5.39	-0.5	43.2
11/23/2023	17	09	51.738	-25	19	09.93	1.2343614	0.4308277	5.45	-0.5	45.0
11/24/2023	17	16	00.915	-25	28	02.38	1.2187587	0.4264493	5.52	-0.5	46.8
11/25/2023	17	22	06.840	-25	35	32.89	1.2025028	0.4218583	5.60	-0.5	48.8
11/26/2023	17	28	08.803	-25	41	40.55	1.1855873	0.4170658	5.68	-0.5	50.9
11/27/2023	17	34	05.997	-25	46	24.57	1.1680072	0.4120844	5.76	-0.5	53.0
11/28/2023	17	39	57.500	-25	49	44.35	1.1497600	0.4069282	5.85	-0.5	55.3
11/29/2023	17	45	42.263	-25	51	39.53	1.1308457	0.4016132	5.95	-0.5	57.8
11/30/2023	17	51	19.097	-25	52	09.96	1.1112684	0.3961572	6.06	-0.5	60.4
12/01/2023	17	56	46.651	-25	51	15.82	1.0910368	0.3905803	6.17	-0.5	63.1
12/02/2023	18	02	03.398	-25	48	57.62	1.0701658	0.3849051	6.29	-0.5	66.0
12/03/2023	18	07	07.611	-25	45	16.26	1.0486776	0.3791564	6.42	-0.5	69.1
12/04/2023	18	11	57.347	-25	40	13.13	1.0266038	0.3733623	6.56	-0.5	72.3
12/05/2023	18	16	30.424	-25	33	50.07	1.0039871	0.3675534	6.70	-0.5	75.8
12/06/2023	18	20	44.403	-25	26	09.49	0.9808839	0.3617637	6.86	-0.5	79.5
12/07/2023	18	24	36.581	-25	17	14.39	0.9573666	0.3560304	7.03	-0.5	83.5
12/08/2023	18	28	03.984	-25	07	08.34	0.9335267	0.3503937	7.21	-0.4	87.7
12/09/2023	18	31	03.377	-24	55	55.50	0.9094776	0.3448971	7.40	-0.3	92.1
12/10/2023	18	33	31.303	-24	43	40.58	0.8853581	0.3395872	7.60	-0.3	96.9
12/11/2023	18	35	24.141	-24	30	28.73	0.8613347	0.3345128	7.81	-0.1	101.9
12/12/2023	18	36	38.213	-24	16	25.43	0.8376049	0.3297250	8.03	0.0	107.2
12/13/2023	18	37	09.946	-24	01	36.36	0.8143979	0.3252757	8.26	0.2	112.9
12/14/2023	18	36	56.091	-23	46	07.17	0.7919755	0.3212173	8.50	0.5	118.8
12/15/2023	18	35	54.019	-23	30	03.40	0.7706291	0.3176009	8.73	0.8	125.1

Mercury - Apparent data

Date 0 h TT	Right Ascension			Declination			Earth	Solar	Equatorial	Mag.	Phase Angle deg.
	h	m	s	d	m	s	Distance au	Distance au	Diameter arc sec		
12/16/2023	18	34	02.084	-23	13	30.44	0.7506755	0.3144751	8.97	1.2	131.7
12/17/2023	18	31	20.024	-22	56	33.68	0.7324476	0.3118841	9.19	1.7	138.5
12/18/2023	18	27	49.372	-22	39	18.91	0.7162818	0.3098667	9.40	2.3	145.6
12/19/2023	18	23	33.793	-22	21	53.07	0.7025022	0.3084541	9.58	3.0	152.8
12/20/2023	18	18	39.267	-22	04	25.08	0.6914008	0.3076686	9.73	3.8	160.0
12/21/2023	18	13	14.037	-21	47	06.76	0.6832176	0.3075231	9.85	4.7	167.0
12/22/2023	18	07	28.254	-21	30	13.34	0.6781218	0.3080199	9.92	5.5	172.5
12/23/2023	18	01	33.345	-21	14	03.44	0.6761987	0.3091509	9.95	5.5	172.1
12/24/2023	17	55	41.167	-20	58	58.06	0.6774420	0.3108978	9.93	4.7	166.4
12/25/2023	17	50	03.106	-20	45	19.00	0.6817561	0.3132331	9.87	3.8	159.6
12/26/2023	17	44	49.261	-20	33	26.65	0.6889656	0.3161214	9.77	3.0	152.7
12/27/2023	17	40	07.865	-20	23	38.02	0.6988310	0.3195208	9.63	2.4	145.9
12/28/2023	17	36	04.989	-20	16	05.14	0.7110682	0.3233843	9.46	1.8	139.3
12/29/2023	17	32	44.526	-20	10	54.24	0.7253681	0.3276618	9.28	1.4	133.1
12/30/2023	17	30	08.388	-20	08	05.77	0.7414146	0.3323015	9.08	1.0	127.2
12/31/2023	17	28	16.837	-20	07	35.00	0.7588988	0.3372510	8.87	0.7	121.6
01/01/2024	17	27	08.864	-20	09	13.00	0.7775301	0.3424588	8.66	0.5	116.3
01/02/2024	17	26	42.556	-20	12	47.81	0.7970423	0.3478751	8.44	0.3	111.4



Venus - Apparent data

Date 0 h TT	Right Ascension			Declination			Earth	Solar	Equatorial	Mag.	Phase Angle deg.
	h	m	s	d	m	s	Distance au	Distance au	Diameter arc sec		
12/31/2022	19	53	37.433	-22	15	29.21	1.6103980	0.7281767	10.36	-3.9	22.5
01/01/2023	19	58	56.888	-22	02	13.62	1.6075185	0.7281565	10.38	-3.9	22.8
01/02/2023	20	04	15.252	-21	48	18.56	1.6046028	0.7281327	10.40	-3.9	23.2
01/03/2023	20	09	32.490	-21	33	44.61	1.6016511	0.7281051	10.42	-3.9	23.5
01/04/2023	20	14	48.569	-21	18	32.38	1.5986636	0.7280738	10.44	-3.9	23.9
01/05/2023	20	20	03.460	-21	02	42.50	1.5956406	0.7280389	10.46	-3.9	24.2
01/06/2023	20	25	17.137	-20	46	15.59	1.5925820	0.7280003	10.48	-3.9	24.6
01/07/2023	20	30	29.575	-20	29	12.30	1.5894880	0.7279581	10.50	-3.9	25.0
01/08/2023	20	35	40.754	-20	11	33.30	1.5863587	0.7279124	10.52	-3.9	25.3
01/09/2023	20	40	50.657	-19	53	19.26	1.5831940	0.7278631	10.54	-3.9	25.7
01/10/2023	20	45	59.267	-19	34	30.86	1.5799939	0.7278103	10.56	-3.9	26.1
01/11/2023	20	51	06.575	-19	15	08.80	1.5767584	0.7277541	10.58	-3.9	26.5
01/12/2023	20	56	12.570	-18	55	13.78	1.5734873	0.7276944	10.61	-3.9	26.9
01/13/2023	21	01	17.248	-18	34	46.51	1.5701805	0.7276314	10.63	-3.9	27.3
01/14/2023	21	06	20.606	-18	13	47.72	1.5668379	0.7275650	10.65	-3.9	27.7
01/15/2023	21	11	22.643	-17	52	18.13	1.5634591	0.7274953	10.67	-3.9	28.0
01/16/2023	21	16	23.363	-17	30	18.49	1.5600440	0.7274225	10.70	-3.9	28.4
01/17/2023	21	21	22.768	-17	07	49.54	1.5565922	0.7273464	10.72	-3.9	28.8
01/18/2023	21	26	20.866	-16	44	52.04	1.5531034	0.7272673	10.75	-3.9	29.2
01/19/2023	21	31	17.663	-16	21	26.78	1.5495771	0.7271851	10.77	-3.9	29.5
01/20/2023	21	36	13.165	-15	57	34.53	1.5460129	0.7270999	10.79	-3.9	29.9
01/21/2023	21	41	07.380	-15	33	16.11	1.5424105	0.7270118	10.82	-3.9	30.2
01/22/2023	21	46	00.315	-15	08	32.30	1.5387695	0.7269209	10.85	-3.9	30.6
01/23/2023	21	50	51.981	-14	43	23.91	1.5350896	0.7268271	10.87	-3.9	30.9
01/24/2023	21	55	42.389	-14	17	51.76	1.5313707	0.7267306	10.90	-3.9	31.2
01/25/2023	22	00	31.556	-13	51	56.62	1.5276126	0.7266315	10.92	-3.9	31.5
01/26/2023	22	05	19.502	-13	25	39.30	1.5238155	0.7265299	10.95	-3.9	31.8
01/27/2023	22	10	06.249	-12	59	00.61	1.5199794	0.7264257	10.98	-3.9	32.2
01/28/2023	22	14	51.820	-12	32	01.33	1.5161045	0.7263192	11.01	-3.9	32.5
01/29/2023	22	19	36.242	-12	04	42.27	1.5121909	0.7262103	11.04	-3.9	32.8
01/30/2023	22	24	19.541	-11	37	04.23	1.5082388	0.7260991	11.06	-3.9	33.2
01/31/2023	22	29	01.744	-11	09	08.02	1.5042484	0.7259858	11.09	-3.9	33.5
02/01/2023	22	33	42.880	-10	40	54.43	1.5002197	0.7258705	11.12	-3.9	33.8
02/02/2023	22	38	22.979	-10	12	24.25	1.4961530	0.7257531	11.15	-3.9	34.2
02/03/2023	22	43	02.074	-09	43	38.26	1.4920482	0.7256338	11.18	-3.9	34.6
02/04/2023	22	47	40.196	-09	14	37.25	1.4879055	0.7255128	11.22	-3.9	34.9
02/05/2023	22	52	17.379	-08	45	22.00	1.4837249	0.7253900	11.25	-3.9	35.3
02/06/2023	22	56	53.660	-08	15	53.26	1.4795064	0.7252657	11.28	-3.9	35.7
02/07/2023	23	01	29.074	-07	46	11.81	1.4752501	0.7251398	11.31	-3.9	36.1
02/08/2023	23	06	03.659	-07	16	18.39	1.4709559	0.7250124	11.35	-3.9	36.5
02/09/2023	23	10	37.456	-06	46	13.77	1.4666238	0.7248838	11.38	-3.9	36.9
02/10/2023	23	15	10.503	-06	15	58.67	1.4622535	0.7247539	11.41	-3.9	37.3
02/11/2023	23	19	42.843	-05	45	33.84	1.4578451	0.7246229	11.45	-3.9	37.8
02/12/2023	23	24	14.517	-05	15	00.02	1.4533982	0.7244909	11.48	-3.9	38.2
02/13/2023	23	28	45.567	-04	44	17.94	1.4489127	0.7243579	11.52	-3.9	38.6
02/14/2023	23	33	16.035	-04	13	28.34	1.4443882	0.7242242	11.55	-3.9	39.0
02/15/2023	23	37	45.962	-03	42	31.95	1.4398245	0.7240897	11.59	-3.9	39.4
02/16/2023	23	42	15.389	-03	11	29.51	1.4352211	0.7239546	11.63	-3.9	39.8
02/17/2023	23	46	44.356	-02	40	21.78	1.4305776	0.7238189	11.67	-3.9	40.2
02/18/2023	23	51	12.899	-02	09	09.51	1.4258935	0.7236829	11.70	-3.9	40.6

Venus - Apparent data

Date 0 h TT	Right Ascension			Declination			Earth	Solar	Equatorial	Mag.	Phase Angle deg.
	h	m	s	d	m	s	Distance au	Distance au	Diameter arc sec		
02/19/2023	23	55	41.056	-01	37	53.45	1.4211685	0.7235466	11.74	-3.9	41.0
02/20/2023	00	00	08.866	-01	06	34.37	1.4164019	0.7234101	11.78	-3.9	41.4
02/21/2023	00	04	36.366	-00	35	13.03	1.4115936	0.7232735	11.82	-3.9	41.8
02/22/2023	00	09	03.596	-00	03	50.18	1.4067433	0.7231370	11.86	-3.9	42.1
02/23/2023	00	13	30.595	00	27	33.44	1.4018507	0.7230005	11.90	-3.9	42.5
02/24/2023	00	17	57.404	00	58	57.07	1.3969160	0.7228643	11.95	-3.9	42.8
02/25/2023	00	22	24.062	01	30	19.98	1.3919390	0.7227285	11.99	-3.9	43.2
02/26/2023	00	26	50.609	02	01	41.41	1.3869200	0.7225931	12.03	-3.9	43.5
02/27/2023	00	31	17.082	02	33	00.62	1.3818590	0.7224582	12.08	-3.9	43.9
02/28/2023	00	35	43.519	03	04	16.87	1.3767562	0.7223240	12.12	-3.9	44.2
03/01/2023	00	40	09.959	03	35	29.41	1.3716117	0.7221906	12.17	-3.9	44.6
03/02/2023	00	44	36.440	04	06	37.50	1.3664257	0.7220580	12.21	-3.9	45.0
03/03/2023	00	49	03.000	04	37	40.42	1.3611983	0.7219264	12.26	-3.9	45.3
03/04/2023	00	53	29.677	05	08	37.43	1.3559298	0.7217959	12.31	-3.9	45.7
03/05/2023	00	57	56.508	05	39	27.81	1.3506202	0.7216665	12.36	-3.9	46.1
03/06/2023	01	02	23.533	06	10	10.84	1.3452697	0.7215385	12.41	-3.9	46.5
03/07/2023	01	06	50.790	06	40	45.79	1.3398784	0.7214118	12.46	-3.9	46.9
03/08/2023	01	11	18.316	07	11	11.96	1.3344465	0.7212866	12.51	-3.9	47.3
03/09/2023	01	15	46.151	07	41	28.63	1.3289741	0.7211630	12.56	-3.9	47.7
03/10/2023	01	20	14.334	08	11	35.11	1.3234612	0.7210411	12.61	-3.9	48.1
03/11/2023	01	24	42.901	08	41	30.70	1.3179080	0.7209210	12.66	-3.9	48.6
03/12/2023	01	29	11.891	09	11	14.70	1.3123144	0.7208027	12.72	-3.9	49.0
03/13/2023	01	33	41.339	09	40	46.41	1.3066803	0.7206864	12.77	-3.9	49.5
03/14/2023	01	38	11.281	10	10	05.13	1.3010057	0.7205721	12.83	-3.9	49.9
03/15/2023	01	42	41.749	10	39	10.16	1.2952905	0.7204600	12.88	-3.9	50.4
03/16/2023	01	47	12.773	11	08	00.80	1.2895345	0.7203502	12.94	-3.9	50.8
03/17/2023	01	51	44.384	11	36	36.32	1.2837373	0.7202427	13.00	-3.9	51.3
03/18/2023	01	56	16.607	12	04	56.00	1.2778988	0.7201376	13.06	-3.9	51.7
03/19/2023	02	00	49.468	12	32	59.11	1.2720185	0.7200349	13.12	-4.0	52.1
03/20/2023	02	05	22.993	13	00	44.91	1.2660963	0.7199349	13.18	-4.0	52.6
03/21/2023	02	09	57.203	13	28	12.67	1.2601317	0.7198375	13.24	-4.0	53.0
03/22/2023	02	14	32.122	13	55	21.65	1.2541246	0.7197429	13.31	-4.0	53.4
03/23/2023	02	19	07.771	14	22	11.14	1.2480749	0.7196511	13.37	-4.0	53.8
03/24/2023	02	23	44.166	14	48	40.40	1.2419825	0.7195621	13.44	-4.0	54.2
03/25/2023	02	28	21.324	15	14	48.71	1.2358475	0.7194762	13.50	-4.0	54.6
03/26/2023	02	32	59.257	15	40	35.35	1.2296700	0.7193932	13.57	-4.0	55.0
03/27/2023	02	37	37.975	16	05	59.60	1.2234502	0.7193134	13.64	-4.0	55.4
03/28/2023	02	42	17.486	16	31	00.74	1.2171884	0.7192367	13.71	-4.0	55.8
03/29/2023	02	46	57.799	16	55	38.06	1.2108849	0.7191632	13.78	-4.0	56.2
03/30/2023	02	51	38.918	17	19	50.86	1.2045400	0.7190930	13.85	-4.0	56.6
03/31/2023	02	56	20.848	17	43	38.44	1.1981541	0.7190262	13.93	-4.0	57.0
04/01/2023	03	01	03.590	18	07	00.11	1.1917275	0.7189627	14.00	-4.0	57.4
04/02/2023	03	05	47.146	18	29	55.20	1.1852607	0.7189027	14.08	-4.0	57.8
04/03/2023	03	10	31.514	18	52	23.02	1.1787539	0.7188462	14.16	-4.0	58.2
04/04/2023	03	15	16.693	19	14	22.94	1.1722077	0.7187932	14.24	-4.0	58.6
04/05/2023	03	20	02.679	19	35	54.30	1.1656224	0.7187438	14.32	-4.0	59.0
04/06/2023	03	24	49.466	19	56	56.48	1.1589986	0.7186981	14.40	-4.0	59.4
04/07/2023	03	29	37.049	20	17	28.86	1.1523365	0.7186559	14.48	-4.0	59.9
04/08/2023	03	34	25.416	20	37	30.85	1.1456367	0.7186175	14.57	-4.0	60.3
04/09/2023	03	39	14.558	20	57	01.86	1.1388995	0.7185828	14.65	-4.0	60.8

Venus - Apparent data

Date 0 h TT	Right Ascension			Declination			Earth	Solar	Equatorial	Mag.	Phase Angle deg.
	h	m	s	d	m	s	Distance au	Distance au	Diameter arc sec		
04/10/2023	03	44	04.459	21	16	01.34	1.1321253	0.7185519	14.74	-4.0	61.2
04/11/2023	03	48	55.103	21	34	28.72	1.1253143	0.7185247	14.83	-4.0	61.7
04/12/2023	03	53	46.468	21	52	23.46	1.1184668	0.7185013	14.92	-4.0	62.2
04/13/2023	03	58	38.531	22	09	45.02	1.1115829	0.7184818	15.01	-4.0	62.7
04/14/2023	04	03	31.265	22	26	32.86	1.1046628	0.7184660	15.11	-4.0	63.2
04/15/2023	04	08	24.640	22	42	46.48	1.0977065	0.7184542	15.20	-4.0	63.7
04/16/2023	04	13	18.623	22	58	25.36	1.0907141	0.7184462	15.30	-4.0	64.2
04/17/2023	04	18	13.180	23	13	29.01	1.0836856	0.7184420	15.40	-4.1	64.7
04/18/2023	04	23	08.274	23	27	56.95	1.0766209	0.7184417	15.50	-4.1	65.1
04/19/2023	04	28	03.865	23	41	48.73	1.0695201	0.7184453	15.60	-4.1	65.6
04/20/2023	04	32	59.906	23	55	03.94	1.0623832	0.7184528	15.71	-4.1	66.1
04/21/2023	04	37	56.351	24	07	42.18	1.0552106	0.7184641	15.82	-4.1	66.6
04/22/2023	04	42	53.145	24	19	43.06	1.0480023	0.7184793	15.92	-4.1	67.1
04/23/2023	04	47	50.232	24	31	06.24	1.0407587	0.7184983	16.03	-4.1	67.5
04/24/2023	04	52	47.552	24	41	51.40	1.0334802	0.7185211	16.15	-4.1	68.0
04/25/2023	04	57	45.043	24	51	58.23	1.0261673	0.7185477	16.26	-4.1	68.4
04/26/2023	05	02	42.639	25	01	26.46	1.0188205	0.7185781	16.38	-4.1	68.9
04/27/2023	05	07	40.276	25	10	15.84	1.0114404	0.7186123	16.50	-4.1	69.3
04/28/2023	05	12	37.884	25	18	26.16	1.0040276	0.7186502	16.62	-4.1	69.8
04/29/2023	05	17	35.396	25	25	57.23	0.9965828	0.7186918	16.75	-4.1	70.2
04/30/2023	05	22	32.742	25	32	48.90	0.9891067	0.7187371	16.87	-4.1	70.6
05/01/2023	05	27	29.850	25	39	01.06	0.9815999	0.7187860	17.00	-4.1	71.1
05/02/2023	05	32	26.650	25	44	33.62	0.9740633	0.7188385	17.13	-4.2	71.5
05/03/2023	05	37	23.068	25	49	26.52	0.9664976	0.7188946	17.27	-4.2	72.0
05/04/2023	05	42	19.034	25	53	39.74	0.9589037	0.7189541	17.40	-4.2	72.4
05/05/2023	05	47	14.473	25	57	13.32	0.9512824	0.7190171	17.54	-4.2	72.9
05/06/2023	05	52	09.314	26	00	07.31	0.9436345	0.7190835	17.69	-4.2	73.4
05/07/2023	05	57	03.483	26	02	21.80	0.9359610	0.7191533	17.83	-4.2	73.9
05/08/2023	06	01	56.906	26	03	56.92	0.9282626	0.7192264	17.98	-4.2	74.4
05/09/2023	06	06	49.509	26	04	52.82	0.9205401	0.7193027	18.13	-4.2	74.9
05/10/2023	06	11	41.217	26	05	09.69	0.9127942	0.7193821	18.28	-4.2	75.4
05/11/2023	06	16	31.955	26	04	47.72	0.9050256	0.7194647	18.44	-4.2	76.0
05/12/2023	06	21	21.648	26	03	47.13	0.8972349	0.7195503	18.60	-4.2	76.5
05/13/2023	06	26	10.222	26	02	08.19	0.8894226	0.7196389	18.76	-4.2	77.1
05/14/2023	06	30	57.603	25	59	51.14	0.8815891	0.7197304	18.93	-4.2	77.6
05/15/2023	06	35	43.717	25	56	56.31	0.8737349	0.7198248	19.10	-4.2	78.2
05/16/2023	06	40	28.491	25	53	24.02	0.8658603	0.7199219	19.27	-4.2	78.8
05/17/2023	06	45	11.849	25	49	14.65	0.8579660	0.7200216	19.45	-4.2	79.3
05/18/2023	06	49	53.717	25	44	28.59	0.8500522	0.7201240	19.63	-4.2	79.9
05/19/2023	06	54	34.016	25	39	06.28	0.8421195	0.7202289	19.82	-4.3	80.5
05/20/2023	06	59	12.668	25	33	08.20	0.8341685	0.7203362	20.01	-4.3	81.1
05/21/2023	07	03	49.593	25	26	34.83	0.8261998	0.7204458	20.20	-4.3	81.6
05/22/2023	07	08	24.711	25	19	26.71	0.8182141	0.7205578	20.40	-4.3	82.2
05/23/2023	07	12	57.941	25	11	44.37	0.8102122	0.7206718	20.60	-4.3	82.8
05/24/2023	07	17	29.206	25	03	28.41	0.8021951	0.7207880	20.80	-4.3	83.3
05/25/2023	07	21	58.427	24	54	39.39	0.7941635	0.7209061	21.01	-4.3	83.9
05/26/2023	07	26	25.527	24	45	17.96	0.7861185	0.7210262	21.23	-4.3	84.4
05/27/2023	07	30	50.432	24	35	24.75	0.7780611	0.7211480	21.45	-4.3	85.0
05/28/2023	07	35	13.067	24	25	00.42	0.7699924	0.7212715	21.67	-4.3	85.5
05/29/2023	07	39	33.360	24	14	05.66	0.7619136	0.7213966	21.90	-4.4	86.1

Venus - Apparent data

Date 0 h TT	Right Ascension			Declination			Earth	Solar	Equatorial	Mag.	Phase Angle deg.
	h	m	s	d	m	s	Distance au	Distance au	Diameter arc sec		
05/30/2023	07	43	51.239	24	02	41.18	0.7538258	0.7215233	22.14	-4.4	86.7
05/31/2023	07	48	06.635	23	50	47.72	0.7457304	0.7216513	22.38	-4.4	87.2
06/01/2023	07	52	19.479	23	38	26.01	0.7376286	0.7217806	22.62	-4.4	87.8
06/02/2023	07	56	29.705	23	25	36.83	0.7295219	0.7219111	22.88	-4.4	88.4
06/03/2023	08	00	37.245	23	12	20.98	0.7214116	0.7220427	23.13	-4.4	89.0
06/04/2023	08	04	42.036	22	58	39.25	0.7132994	0.7221753	23.40	-4.4	89.5
06/05/2023	08	08	44.012	22	44	32.47	0.7051865	0.7223088	23.67	-4.4	90.2
06/06/2023	08	12	43.110	22	30	01.46	0.6970747	0.7224431	23.94	-4.4	90.8
06/07/2023	08	16	39.267	22	15	07.06	0.6889652	0.7225780	24.22	-4.4	91.4
06/08/2023	08	20	32.421	21	59	50.10	0.6808595	0.7227135	24.51	-4.5	92.1
06/09/2023	08	24	22.510	21	44	11.40	0.6727589	0.7228494	24.81	-4.5	92.7
06/10/2023	08	28	09.474	21	28	11.79	0.6646647	0.7229857	25.11	-4.5	93.4
06/11/2023	08	31	53.251	21	11	52.13	0.6565782	0.7231223	25.42	-4.5	94.1
06/12/2023	08	35	33.779	20	55	13.27	0.6485004	0.7232590	25.73	-4.5	94.9
06/13/2023	08	39	10.992	20	38	16.09	0.6404327	0.7233957	26.06	-4.5	95.6
06/14/2023	08	42	44.823	20	21	01.49	0.6323762	0.7235324	26.39	-4.5	96.3
06/15/2023	08	46	15.197	20	03	30.40	0.6243323	0.7236688	26.73	-4.5	97.1
06/16/2023	08	49	42.039	19	45	43.75	0.6163023	0.7238050	27.08	-4.5	97.9
06/17/2023	08	53	05.268	19	27	42.51	0.6082876	0.7239408	27.44	-4.5	98.6
06/18/2023	08	56	24.797	19	09	27.68	0.6002897	0.7240761	27.80	-4.5	99.4
06/19/2023	08	59	40.538	18	51	00.24	0.5923103	0.7242108	28.18	-4.5	100.2
06/20/2023	09	02	52.398	18	32	21.24	0.5843511	0.7243448	28.56	-4.6	101.0
06/21/2023	09	06	00.279	18	13	31.70	0.5764139	0.7244779	28.95	-4.6	101.8
06/22/2023	09	09	04.082	17	54	32.69	0.5685007	0.7246102	29.36	-4.6	102.6
06/23/2023	09	12	03.703	17	35	25.28	0.5606136	0.7247414	29.77	-4.6	103.5
06/24/2023	09	14	59.033	17	16	10.56	0.5527549	0.7248715	30.19	-4.6	104.3
06/25/2023	09	17	49.963	16	56	49.66	0.5449268	0.7250004	30.62	-4.6	105.1
06/26/2023	09	20	36.375	16	37	23.72	0.5371319	0.7251280	31.07	-4.6	105.9
06/27/2023	09	23	18.151	16	17	53.89	0.5293728	0.7252541	31.52	-4.6	106.8
06/28/2023	09	25	55.166	15	58	21.37	0.5216522	0.7253787	31.99	-4.6	107.6
06/29/2023	09	28	27.291	15	38	47.37	0.5139730	0.7255018	32.47	-4.6	108.5
06/30/2023	09	30	54.393	15	19	13.13	0.5063385	0.7256231	32.96	-4.7	109.4
07/01/2023	09	33	16.333	14	59	39.93	0.4987518	0.7257426	33.46	-4.7	110.3
07/02/2023	09	35	32.971	14	40	09.05	0.4912163	0.7258602	33.97	-4.7	111.2
07/03/2023	09	37	44.159	14	20	41.82	0.4837358	0.7259759	34.50	-4.7	112.1
07/04/2023	09	39	49.748	14	01	19.57	0.4763138	0.7260894	35.04	-4.7	113.1
07/05/2023	09	41	49.584	13	42	03.65	0.4689543	0.7262009	35.59	-4.7	114.1
07/06/2023	09	43	43.512	13	22	55.40	0.4616610	0.7263100	36.15	-4.7	115.1
07/07/2023	09	45	31.375	13	03	56.19	0.4544380	0.7264169	36.72	-4.7	116.1
07/08/2023	09	47	13.013	12	45	07.41	0.4472892	0.7265213	37.31	-4.7	117.2
07/09/2023	09	48	48.259	12	26	30.47	0.4402187	0.7266233	37.91	-4.7	118.3
07/10/2023	09	50	16.944	12	08	06.86	0.4332307	0.7267227	38.52	-4.7	119.5
07/11/2023	09	51	38.891	11	49	58.08	0.4263295	0.7268195	39.14	-4.7	120.6
07/12/2023	09	52	53.917	11	32	05.72	0.4195196	0.7269135	39.78	-4.7	121.8
07/13/2023	09	54	01.834	11	14	31.42	0.4128058	0.7270048	40.43	-4.7	123.1
07/14/2023	09	55	02.451	10	57	16.86	0.4061929	0.7270932	41.08	-4.7	124.3
07/15/2023	09	55	55.572	10	40	23.81	0.3996862	0.7271787	41.75	-4.7	125.7
07/16/2023	09	56	41.002	10	23	54.06	0.3932912	0.7272612	42.43	-4.7	127.0
07/17/2023	09	57	18.546	10	07	49.47	0.3870135	0.7273407	43.12	-4.7	128.3
07/18/2023	09	57	48.014	09	52	11.95	0.3808593	0.7274171	43.82	-4.7	129.7

Venus - Apparent data

Date 0 h TT	Right Ascension			Declination			Earth	Solar	Equatorial	Mag.	Phase Angle deg.
	h	m	s	d	m	s	Distance au	Distance au	Diameter arc sec		
07/19/2023	09	58	09.222	09	37	03.44	0.3748348	0.7274903	44.52	-4.7	131.2
07/20/2023	09	58	21.993	09	22	25.93	0.3689466	0.7275603	45.23	-4.6	132.6
07/21/2023	09	58	26.165	09	08	21.44	0.3632016	0.7276270	45.95	-4.6	134.1
07/22/2023	09	58	21.589	08	54	51.99	0.3576072	0.7276904	46.67	-4.6	135.6
07/23/2023	09	58	08.139	08	41	59.66	0.3521707	0.7277504	47.39	-4.6	137.1
07/24/2023	09	57	45.710	08	29	46.48	0.3468999	0.7278070	48.11	-4.6	138.7
07/25/2023	09	57	14.224	08	18	14.50	0.3418027	0.7278602	48.82	-4.6	140.3
07/26/2023	09	56	33.637	08	07	25.73	0.3368876	0.7279099	49.54	-4.5	141.9
07/27/2023	09	55	43.945	07	57	22.12	0.3321628	0.7279560	50.24	-4.5	143.5
07/28/2023	09	54	45.181	07	48	05.56	0.3276370	0.7279986	50.94	-4.5	145.2
07/29/2023	09	53	37.433	07	39	37.84	0.3233190	0.7280376	51.62	-4.5	146.8
07/30/2023	09	52	20.838	07	32	00.60	0.3192174	0.7280729	52.28	-4.4	148.5
07/31/2023	09	50	55.594	07	25	15.35	0.3153411	0.7281046	52.92	-4.4	150.3
08/01/2023	09	49	21.964	07	19	23.33	0.3116987	0.7281326	53.54	-4.4	152.0
08/02/2023	09	47	40.277	07	14	25.59	0.3082986	0.7281570	54.13	-4.3	153.7
08/03/2023	09	45	50.937	07	10	22.84	0.3051489	0.7281776	54.69	-4.3	155.5
08/04/2023	09	43	54.415	07	07	15.53	0.3022570	0.7281945	55.21	-4.2	157.2
08/05/2023	09	41	51.254	07	05	03.76	0.2996301	0.7282076	55.70	-4.2	159.0
08/06/2023	09	39	42.058	07	03	47.35	0.2972745	0.7282170	56.14	-4.1	160.7
08/07/2023	09	37	27.494	07	03	25.77	0.2951960	0.7282227	56.53	-4.1	162.4
08/08/2023	09	35	08.284	07	03	58.20	0.2933996	0.7282246	56.88	-4.1	164.0
08/09/2023	09	32	45.197	07	05	23.48	0.2918897	0.7282227	57.17	-4.1	165.5
08/10/2023	09	30	19.047	07	07	40.13	0.2906698	0.7282170	57.41	-4.1	166.9
08/11/2023	09	27	50.683	07	10	46.34	0.2897426	0.7282076	57.60	-4.1	168.0
08/12/2023	09	25	20.984	07	14	40.00	0.2891102	0.7281945	57.72	-4.1	168.8
08/13/2023	09	22	50.845	07	19	18.70	0.2887735	0.7281776	57.79	-4.1	169.2
08/14/2023	09	20	21.173	07	24	39.75	0.2887328	0.7281570	57.80	-4.1	169.2
08/15/2023	09	17	52.870	07	30	40.22	0.2889874	0.7281327	57.75	-4.1	168.7
08/16/2023	09	15	26.830	07	37	16.98	0.2895357	0.7281047	57.64	-4.1	167.8
08/17/2023	09	13	03.922	07	44	26.72	0.2903752	0.7280730	57.47	-4.1	166.7
08/18/2023	09	10	44.985	07	52	05.99	0.2915028	0.7280377	57.25	-4.1	165.3
08/19/2023	09	08	30.820	08	00	11.28	0.2929145	0.7279988	56.97	-4.1	163.7
08/20/2023	09	06	22.178	08	08	38.99	0.2946054	0.7279562	56.65	-4.1	162.1
08/21/2023	09	04	19.756	08	17	25.54	0.2965703	0.7279102	56.27	-4.2	160.4
08/22/2023	09	02	24.194	08	26	27.37	0.2988032	0.7278605	55.85	-4.2	158.6
08/23/2023	09	00	36.069	08	35	40.97	0.3012975	0.7278074	55.39	-4.3	156.8
08/24/2023	08	58	55.890	08	45	02.91	0.3040462	0.7277509	54.89	-4.3	155.0
08/25/2023	08	57	24.105	08	54	29.89	0.3070421	0.7276910	54.35	-4.4	153.2
08/26/2023	08	56	01.093	09	03	58.71	0.3102775	0.7276276	53.79	-4.4	151.4
08/27/2023	08	54	47.170	09	13	26.31	0.3137445	0.7275610	53.19	-4.4	149.7
08/28/2023	08	53	42.590	09	22	49.77	0.3174350	0.7274911	52.57	-4.5	148.0
08/29/2023	08	52	47.548	09	32	06.33	0.3213405	0.7274181	51.93	-4.5	146.3
08/30/2023	08	52	02.184	09	41	13.34	0.3254528	0.7273418	51.28	-4.6	144.6
08/31/2023	08	51	26.584	09	50	08.30	0.3297631	0.7272625	50.61	-4.6	143.0
09/01/2023	08	51	00.785	09	58	48.90	0.3342629	0.7271801	49.93	-4.6	141.4
09/02/2023	08	50	44.776	10	07	12.96	0.3389434	0.7270947	49.24	-4.6	139.8
09/03/2023	08	50	38.500	10	15	18.51	0.3437959	0.7270065	48.54	-4.7	138.3
09/04/2023	08	50	41.861	10	23	03.78	0.3488121	0.7269154	47.84	-4.7	136.8
09/05/2023	08	50	54.724	10	30	27.14	0.3539835	0.7268215	47.14	-4.7	135.3
09/06/2023	08	51	16.924	10	37	27.19	0.3593021	0.7267249	46.45	-4.7	133.8

Venus - Apparent data

Date 0 h TT	Right Ascension			Declination			Earth	Solar	Equatorial	Mag.	Phase Angle deg.
	h	m	s	d	m	s	Distance au	Distance au	Diameter arc sec		
09/07/2023	08	51	48.267	10	44	02.63	0.3647603	0.7266257	45.75	-4.7	132.4
09/08/2023	08	52	28.543	10	50	12.32	0.3703505	0.7265239	45.06	-4.7	131.0
09/09/2023	08	53	17.523	10	55	55.25	0.3760657	0.7264196	44.38	-4.7	129.6
09/10/2023	08	54	14.968	11	01	10.51	0.3818991	0.7263130	43.70	-4.7	128.3
09/11/2023	08	55	20.627	11	05	57.30	0.3878443	0.7262040	43.03	-4.8	126.9
09/12/2023	08	56	34.247	11	10	14.89	0.3938951	0.7260928	42.37	-4.8	125.6
09/13/2023	08	57	55.570	11	14	02.65	0.4000458	0.7259794	41.72	-4.8	124.3
09/14/2023	08	59	24.335	11	17	20.02	0.4062908	0.7258640	41.07	-4.8	123.1
09/15/2023	09	01	00.283	11	20	06.52	0.4126250	0.7257466	40.44	-4.8	121.8
09/16/2023	09	02	43.157	11	22	21.71	0.4190435	0.7256273	39.82	-4.8	120.6
09/17/2023	09	04	32.704	11	24	05.23	0.4255416	0.7255062	39.22	-4.8	119.4
09/18/2023	09	06	28.673	11	25	16.75	0.4321150	0.7253834	38.62	-4.8	118.2
09/19/2023	09	08	30.819	11	25	56.01	0.4387595	0.7252590	38.04	-4.8	117.1
09/20/2023	09	10	38.904	11	26	02.78	0.4454714	0.7251331	37.46	-4.8	116.0
09/21/2023	09	12	52.695	11	25	36.87	0.4522471	0.7250058	36.90	-4.8	114.9
09/22/2023	09	15	11.965	11	24	38.13	0.4590830	0.7248772	36.35	-4.8	113.8
09/23/2023	09	17	36.494	11	23	06.42	0.4659759	0.7247473	35.81	-4.8	112.8
09/24/2023	09	20	06.069	11	21	01.66	0.4729227	0.7246163	35.29	-4.8	111.8
09/25/2023	09	22	40.486	11	18	23.75	0.4799206	0.7244843	34.77	-4.8	110.8
09/26/2023	09	25	19.546	11	15	12.62	0.4869666	0.7243514	34.27	-4.8	109.9
09/27/2023	09	28	03.060	11	11	28.24	0.4940579	0.7242177	33.78	-4.8	108.9
09/28/2023	09	30	50.846	11	07	10.54	0.5011918	0.7240833	33.30	-4.8	108.0
09/29/2023	09	33	42.728	11	02	19.51	0.5083655	0.7239482	32.83	-4.8	107.2
09/30/2023	09	36	38.536	10	56	55.16	0.5155764	0.7238127	32.37	-4.7	106.3
10/01/2023	09	39	38.104	10	50	57.56	0.5228216	0.7236768	31.92	-4.7	105.5
10/02/2023	09	42	41.269	10	44	26.81	0.5300986	0.7235405	31.48	-4.7	104.7
10/03/2023	09	45	47.869	10	37	23.07	0.5374049	0.7234041	31.05	-4.7	103.9
10/04/2023	09	48	57.747	10	29	46.55	0.5447380	0.7232677	30.64	-4.7	103.1
10/05/2023	09	52	10.749	10	21	37.49	0.5520956	0.7231312	30.23	-4.7	102.3
10/06/2023	09	55	26.725	10	12	56.16	0.5594757	0.7229949	29.83	-4.7	101.5
10/07/2023	09	58	45.533	10	03	42.88	0.5668762	0.7228588	29.44	-4.7	100.8
10/08/2023	10	02	07.034	09	53	57.98	0.5742952	0.7227231	29.06	-4.7	100.0
10/09/2023	10	05	31.097	09	43	41.79	0.5817310	0.7225878	28.69	-4.7	99.2
10/10/2023	10	08	57.598	09	32	54.71	0.5891819	0.7224531	28.32	-4.7	98.5
10/11/2023	10	12	26.416	09	21	37.12	0.5966464	0.7223191	27.97	-4.6	97.7
10/12/2023	10	15	57.438	09	09	49.43	0.6041231	0.7221858	27.62	-4.6	97.0
10/13/2023	10	19	30.556	08	57	32.08	0.6116106	0.7220534	27.29	-4.6	96.3
10/14/2023	10	23	05.669	08	44	45.52	0.6191076	0.7219220	26.96	-4.6	95.5
10/15/2023	10	26	42.680	08	31	30.21	0.6266131	0.7217917	26.63	-4.6	94.8
10/16/2023	10	30	21.498	08	17	46.63	0.6341260	0.7216626	26.32	-4.6	94.1
10/17/2023	10	34	02.038	08	03	35.27	0.6416452	0.7215347	26.01	-4.6	93.3
10/18/2023	10	37	44.217	07	48	56.65	0.6491701	0.7214083	25.71	-4.6	92.6
10/19/2023	10	41	27.961	07	33	51.28	0.6566996	0.7212833	25.41	-4.6	91.9
10/20/2023	10	45	13.197	07	18	19.68	0.6642332	0.7211599	25.12	-4.6	91.2
10/21/2023	10	48	59.859	07	02	22.40	0.6717700	0.7210383	24.84	-4.6	90.5
10/22/2023	10	52	47.884	06	45	59.96	0.6793095	0.7209183	24.57	-4.5	89.9
10/23/2023	10	56	37.217	06	29	12.90	0.6868510	0.7208003	24.30	-4.5	89.2
10/24/2023	11	00	27.804	06	12	01.74	0.6943937	0.7206843	24.03	-4.5	88.6
10/25/2023	11	04	19.601	05	54	27.03	0.7019371	0.7205703	23.77	-4.5	87.9
10/26/2023	11	08	12.564	05	36	29.29	0.7094803	0.7204584	23.52	-4.5	87.3

Venus - Apparent data

Date 0 h TT	Right Ascension			Declination			Earth	Solar	Equatorial	Mag.	Phase Angle deg.
	h	m	s	d	m	s	Distance au	Distance au	Diameter arc sec		
10/27/2023	11	12	06.658	05	18	09.04	0.7170226	0.7203488	23.27	-4.5	86.7
10/28/2023	11	16	01.849	04	59	26.84	0.7245630	0.7202416	23.03	-4.5	86.1
10/29/2023	11	19	58.105	04	40	23.25	0.7321005	0.7201367	22.80	-4.5	85.6
10/30/2023	11	23	55.394	04	20	58.85	0.7396342	0.7200344	22.56	-4.5	85.0
10/31/2023	11	27	53.686	04	01	14.27	0.7471631	0.7199346	22.34	-4.5	84.5
11/01/2023	11	31	52.950	03	41	10.15	0.7546861	0.7198376	22.11	-4.5	83.9
11/02/2023	11	35	53.159	03	20	47.15	0.7622022	0.7197432	21.89	-4.5	83.4
11/03/2023	11	39	54.283	03	00	05.95	0.7697105	0.7196517	21.68	-4.4	82.9
11/04/2023	11	43	56.299	02	39	07.25	0.7772101	0.7195630	21.47	-4.4	82.3
11/05/2023	11	47	59.184	02	17	51.75	0.7847001	0.7194773	21.27	-4.4	81.8
11/06/2023	11	52	02.919	01	56	20.15	0.7921798	0.7193947	21.07	-4.4	81.3
11/07/2023	11	56	07.486	01	34	33.17	0.7996484	0.7193151	20.87	-4.4	80.8
11/08/2023	12	00	12.870	01	12	31.54	0.8071053	0.7192387	20.68	-4.4	80.3
11/09/2023	12	04	19.059	00	50	16.00	0.8145497	0.7191655	20.49	-4.4	79.7
11/10/2023	12	08	26.043	00	27	47.27	0.8219811	0.7190956	20.30	-4.4	79.2
11/11/2023	12	12	33.814	00	05	06.10	0.8293989	0.7190290	20.12	-4.4	78.7
11/12/2023	12	16	42.365	-00	17	46.77	0.8368027	0.7189658	19.94	-4.4	78.2
11/13/2023	12	20	51.692	-00	40	50.58	0.8441919	0.7189061	19.77	-4.3	77.6
11/14/2023	12	25	01.792	-01	04	04.57	0.8515663	0.7188498	19.60	-4.3	77.1
11/15/2023	12	29	12.662	-01	27	27.99	0.8589255	0.7187971	19.43	-4.3	76.5
11/16/2023	12	33	24.304	-01	51	00.06	0.8662693	0.7187480	19.26	-4.3	76.0
11/17/2023	12	37	36.718	-02	14	40.04	0.8735975	0.7187025	19.10	-4.3	75.5
11/18/2023	12	41	49.906	-02	38	27.14	0.8809100	0.7186606	18.94	-4.3	74.9
11/19/2023	12	46	03.876	-03	02	20.61	0.8882066	0.7186224	18.79	-4.3	74.4
11/20/2023	12	50	18.635	-03	26	19.71	0.8954872	0.7185880	18.64	-4.3	73.9
11/21/2023	12	54	34.193	-03	50	23.68	0.9027518	0.7185572	18.49	-4.3	73.3
11/22/2023	12	58	50.567	-04	14	31.80	0.9100000	0.7185303	18.34	-4.3	72.8
11/23/2023	13	03	07.771	-04	38	43.33	0.9172316	0.7185071	18.19	-4.3	72.3
11/24/2023	13	07	25.825	-05	02	57.55	0.9244465	0.7184878	18.05	-4.3	71.8
11/25/2023	13	11	44.746	-05	27	13.72	0.9316441	0.7184723	17.91	-4.3	71.3
11/26/2023	13	16	04.555	-05	51	31.12	0.9388241	0.7184606	17.78	-4.3	70.9
11/27/2023	13	20	25.269	-06	15	48.98	0.9459859	0.7184528	17.64	-4.2	70.4
11/28/2023	13	24	46.904	-06	40	06.55	0.9531289	0.7184488	17.51	-4.2	70.0
11/29/2023	13	29	09.478	-07	04	23.04	0.9602527	0.7184487	17.38	-4.2	69.5
11/30/2023	13	33	33.005	-07	28	37.66	0.9673564	0.7184525	17.25	-4.2	69.1
12/01/2023	13	37	57.501	-07	52	49.60	0.9744396	0.7184601	17.13	-4.2	68.7
12/02/2023	13	42	22.981	-08	16	58.05	0.9815016	0.7184716	17.00	-4.2	68.3
12/03/2023	13	46	49.461	-08	41	02.19	0.9885419	0.7184869	16.88	-4.2	67.9
12/04/2023	13	51	16.955	-09	05	01.20	0.9955599	0.7185060	16.76	-4.2	67.5
12/05/2023	13	55	45.480	-09	28	54.26	1.0025551	0.7185289	16.65	-4.2	67.1
12/06/2023	14	00	15.051	-09	52	40.53	1.0095270	0.7185557	16.53	-4.2	66.7
12/07/2023	14	04	45.684	-10	16	19.19	1.0164751	0.7185862	16.42	-4.2	66.2
12/08/2023	14	09	17.394	-10	39	49.41	1.0233990	0.7186204	16.31	-4.2	65.8
12/09/2023	14	13	50.195	-11	03	10.36	1.0302984	0.7186584	16.20	-4.2	65.4
12/10/2023	14	18	24.101	-11	26	21.20	1.0371727	0.7187001	16.09	-4.1	65.0
12/11/2023	14	22	59.126	-11	49	21.11	1.0440218	0.7187454	15.98	-4.1	64.6
12/12/2023	14	27	35.279	-12	12	09.24	1.0508454	0.7187944	15.88	-4.1	64.2
12/13/2023	14	32	12.572	-12	34	44.77	1.0576433	0.7188469	15.78	-4.1	63.8
12/14/2023	14	36	51.013	-12	57	06.85	1.0644153	0.7189030	15.68	-4.1	63.3
12/15/2023	14	41	30.609	-13	19	14.66	1.0711616	0.7189625	15.58	-4.1	62.9

Venus - Apparent data

Date 0 h TT	Right Ascension			Declination			Earth	Solar	Equatorial	Mag.	Phase Angle deg.
	h	m	s	d	m	s	Distance au	Distance au	Diameter arc sec		
12/16/2023	14	46	11.367	-13	41	07.35	1.0778820	0.7190255	15.48	-4.1	62.4
12/17/2023	14	50	53.296	-14	02	44.10	1.0845767	0.7190919	15.39	-4.1	62.0
12/18/2023	14	55	36.404	-14	24	04.10	1.0912458	0.7191617	15.29	-4.1	61.5
12/19/2023	15	00	20.701	-14	45	06.54	1.0978895	0.7192347	15.20	-4.1	61.1
12/20/2023	15	05	06.199	-15	05	50.63	1.1045077	0.7193109	15.11	-4.1	60.6
12/21/2023	15	09	52.907	-15	26	15.60	1.1111006	0.7193904	15.02	-4.1	60.2
12/22/2023	15	14	40.836	-15	46	20.67	1.1176680	0.7194729	14.93	-4.1	59.8
12/23/2023	15	19	29.994	-16	06	05.07	1.1242101	0.7195584	14.84	-4.1	59.3
12/24/2023	15	24	20.387	-16	25	28.05	1.1307265	0.7196469	14.76	-4.1	58.9
12/25/2023	15	29	12.018	-16	44	28.84	1.1372171	0.7197383	14.67	-4.1	58.5
12/26/2023	15	34	04.888	-17	03	06.68	1.1436816	0.7198325	14.59	-4.1	58.1
12/27/2023	15	38	58.995	-17	21	20.78	1.1501198	0.7199295	14.51	-4.0	57.7
12/28/2023	15	43	54.337	-17	39	10.40	1.1565313	0.7200292	14.43	-4.0	57.3
12/29/2023	15	48	50.906	-17	56	34.75	1.1629156	0.7201314	14.35	-4.0	56.9
12/30/2023	15	53	48.696	-18	13	33.07	1.1692725	0.7202361	14.27	-4.0	56.6
12/31/2023	15	58	47.696	-18	30	04.61	1.1756015	0.7203433	14.20	-4.0	56.2
01/01/2024	16	03	47.896	-18	46	08.63	1.1819023	0.7204527	14.12	-4.0	55.9
01/02/2024	16	08	49.281	-19	01	44.38	1.1881745	0.7205645	14.05	-4.0	55.5



Mars - Apparent data

Date 0 h TT	Right Ascension			Declination			Earth	Solar	Equatorial	Mag.	Phase Angle deg.
	h	m	s	d	m	s	Distance au	Distance au	Diameter arc sec		
12/31/2022	04	28	18.006	24	36	23.73	0.6326548	1.5630287	14.80	-1.2	18.8
01/01/2023	04	27	34.310	24	35	18.02	0.6384140	1.5642464	14.67	-1.2	19.5
01/02/2023	04	26	54.240	24	34	15.77	0.6443240	1.5654599	14.54	-1.2	20.1
01/03/2023	04	26	17.801	24	33	17.27	0.6503811	1.5666692	14.40	-1.2	20.7
01/04/2023	04	25	44.989	24	32	22.81	0.6565819	1.5678741	14.26	-1.1	21.3
01/05/2023	04	25	15.793	24	31	32.63	0.6629228	1.5690746	14.13	-1.1	21.9
01/06/2023	04	24	50.198	24	30	46.94	0.6694006	1.5702705	13.99	-1.1	22.5
01/07/2023	04	24	28.183	24	30	05.93	0.6760119	1.5714619	13.85	-1.0	23.0
01/08/2023	04	24	09.723	24	29	29.75	0.6827534	1.5726486	13.72	-1.0	23.6
01/09/2023	04	23	54.791	24	28	58.53	0.6896221	1.5738306	13.58	-1.0	24.1
01/10/2023	04	23	43.354	24	28	32.38	0.6966146	1.5750077	13.44	-0.9	24.6
01/11/2023	04	23	35.381	24	28	11.38	0.7037282	1.5761799	13.31	-0.9	25.1
01/12/2023	04	23	30.835	24	27	55.61	0.7109596	1.5773471	13.17	-0.9	25.6
01/13/2023	04	23	29.680	24	27	45.10	0.7183059	1.5785093	13.04	-0.8	26.1
01/14/2023	04	23	31.879	24	27	39.89	0.7257643	1.5796663	12.90	-0.8	26.6
01/15/2023	04	23	37.392	24	27	39.99	0.7333318	1.5808182	12.77	-0.8	27.0
01/16/2023	04	23	46.179	24	27	45.42	0.7410057	1.5819647	12.64	-0.7	27.5
01/17/2023	04	23	58.201	24	27	56.17	0.7487830	1.5831058	12.51	-0.7	28.0
01/18/2023	04	24	13.414	24	28	12.21	0.7566610	1.5842416	12.38	-0.7	28.4
01/19/2023	04	24	31.777	24	28	33.51	0.7646368	1.5853718	12.25	-0.6	28.8
01/20/2023	04	24	53.243	24	29	00.02	0.7727075	1.5864964	12.12	-0.6	29.2
01/21/2023	04	25	17.767	24	29	31.68	0.7808701	1.5876154	11.99	-0.6	29.7
01/22/2023	04	25	45.300	24	30	08.37	0.7891215	1.5887286	11.87	-0.5	30.0
01/23/2023	04	26	15.790	24	30	49.98	0.7974585	1.5898361	11.74	-0.5	30.4
01/24/2023	04	26	49.186	24	31	36.34	0.8058781	1.5909377	11.62	-0.5	30.8
01/25/2023	04	27	25.435	24	32	27.30	0.8143771	1.5920334	11.50	-0.5	31.1
01/26/2023	04	28	04.484	24	33	22.68	0.8229523	1.5931230	11.38	-0.4	31.5
01/27/2023	04	28	46.276	24	34	22.30	0.8316009	1.5942066	11.26	-0.4	31.8
01/28/2023	04	29	30.754	24	35	25.98	0.8403200	1.5952841	11.14	-0.4	32.1
01/29/2023	04	30	17.859	24	36	33.51	0.8491070	1.5963554	11.03	-0.3	32.4
01/30/2023	04	31	07.533	24	37	44.69	0.8579592	1.5974204	10.92	-0.3	32.7
01/31/2023	04	31	59.715	24	38	59.32	0.8668742	1.5984790	10.80	-0.3	32.9
02/01/2023	04	32	54.347	24	40	17.18	0.8758498	1.5995313	10.69	-0.3	33.2
02/02/2023	04	33	51.371	24	41	38.04	0.8848838	1.6005771	10.58	-0.2	33.4
02/03/2023	04	34	50.730	24	43	01.67	0.8939739	1.6016164	10.48	-0.2	33.6
02/04/2023	04	35	52.369	24	44	27.85	0.9031183	1.6026492	10.37	-0.2	33.8
02/05/2023	04	36	56.233	24	45	56.35	0.9123150	1.6036752	10.27	-0.1	34.1
02/06/2023	04	38	02.272	24	47	26.93	0.9215621	1.6046946	10.16	-0.1	34.3
02/07/2023	04	39	10.435	24	48	59.37	0.9308579	1.6057072	10.06	-0.1	34.4
02/08/2023	04	40	20.674	24	50	33.43	0.9402008	1.6067130	9.96	-0.1	34.6
02/09/2023	04	41	32.944	24	52	08.89	0.9495889	1.6077119	9.86	-0.0	34.8
02/10/2023	04	42	47.200	24	53	45.54	0.9590209	1.6087039	9.77	-0.0	35.0
02/11/2023	04	44	03.400	24	55	23.15	0.9684950	1.6096888	9.67	0.0	35.2
02/12/2023	04	45	21.505	24	57	01.52	0.9780098	1.6106667	9.58	0.0	35.3
02/13/2023	04	46	41.476	24	58	40.44	0.9875637	1.6116375	9.48	0.1	35.5
02/14/2023	04	48	03.276	25	00	19.73	0.9971553	1.6126011	9.39	0.1	35.7
02/15/2023	04	49	26.868	25	01	59.18	1.0067830	1.6135575	9.30	0.1	35.8
02/16/2023	04	50	52.215	25	03	38.60	1.0164453	1.6145067	9.21	0.1	36.0
02/17/2023	04	52	19.282	25	05	17.80	1.0261405	1.6154485	9.13	0.2	36.2
02/18/2023	04	53	48.032	25	06	56.58	1.0358669	1.6163829	9.04	0.2	36.3

Mars - Apparent data

Date	Right Ascension	Declination	Earth Distance	Solar Distance	Equatorial Diameter	Mag.	Phase Angle
0 h TT	h m s	d m s	au	au	arc sec		deg.
02/19/2023	04 55 18.430	25 08 34.72	1.0456227	1.6173098	8.96	0.2	36.4
02/20/2023	04 56 50.441	25 10 11.99	1.0554060	1.6182293	8.87	0.2	36.6
02/21/2023	04 58 24.029	25 11 48.19	1.0652149	1.6191413	8.79	0.3	36.7
02/22/2023	04 59 59.162	25 13 23.08	1.0750476	1.6200456	8.71	0.3	36.8
02/23/2023	05 01 35.805	25 14 56.46	1.0849020	1.6209423	8.63	0.3	36.9
02/24/2023	05 03 13.923	25 16 28.11	1.0947764	1.6218314	8.55	0.3	37.0
02/25/2023	05 04 53.480	25 17 57.85	1.1046692	1.6227127	8.48	0.3	37.1
02/26/2023	05 06 34.438	25 19 25.47	1.1145786	1.6235862	8.40	0.4	37.2
02/27/2023	05 08 16.761	25 20 50.77	1.1245033	1.6244518	8.33	0.4	37.2
02/28/2023	05 10 00.411	25 22 13.57	1.1344419	1.6253096	8.26	0.4	37.3
03/01/2023	05 11 45.351	25 23 33.66	1.1443930	1.6261594	8.18	0.4	37.3
03/02/2023	05 13 31.547	25 24 50.87	1.1543555	1.6270013	8.11	0.4	37.4
03/03/2023	05 15 18.963	25 26 05.00	1.1643282	1.6278352	8.04	0.5	37.4
03/04/2023	05 17 07.567	25 27 15.86	1.1743101	1.6286610	7.98	0.5	37.4
03/05/2023	05 18 57.326	25 28 23.27	1.1843001	1.6294786	7.91	0.5	37.5
03/06/2023	05 20 48.210	25 29 27.06	1.1942973	1.6302882	7.84	0.5	37.5
03/07/2023	05 22 40.190	25 30 27.04	1.2043008	1.6310895	7.78	0.5	37.5
03/08/2023	05 24 33.240	25 31 23.06	1.2143096	1.6318826	7.71	0.6	37.5
03/09/2023	05 26 27.332	25 32 14.95	1.2243230	1.6326674	7.65	0.6	37.5
03/10/2023	05 28 22.443	25 33 02.55	1.2343403	1.6334439	7.59	0.6	37.5
03/11/2023	05 30 18.550	25 33 45.72	1.2443605	1.6342120	7.53	0.6	37.5
03/12/2023	05 32 15.631	25 34 24.33	1.2543830	1.6349717	7.47	0.6	37.6
03/13/2023	05 34 13.665	25 34 58.23	1.2644070	1.6357230	7.41	0.7	37.6
03/14/2023	05 36 12.631	25 35 27.31	1.2744318	1.6364658	7.35	0.7	37.6
03/15/2023	05 38 12.509	25 35 51.44	1.2844563	1.6372001	7.29	0.7	37.6
03/16/2023	05 40 13.278	25 36 10.50	1.2944799	1.6379258	7.23	0.7	37.6
03/17/2023	05 42 14.917	25 36 24.36	1.3045014	1.6386430	7.18	0.7	37.6
03/18/2023	05 44 17.405	25 36 32.88	1.3145199	1.6393515	7.12	0.8	37.6
03/19/2023	05 46 20.723	25 36 35.95	1.3245342	1.6400513	7.07	0.8	37.6
03/20/2023	05 48 24.851	25 36 33.40	1.3345431	1.6407424	7.02	0.8	37.7
03/21/2023	05 50 29.771	25 36 25.11	1.3445453	1.6414248	6.97	0.8	37.6
03/22/2023	05 52 35.464	25 36 10.94	1.3545395	1.6420984	6.91	0.8	37.6
03/23/2023	05 54 41.913	25 35 50.76	1.3645244	1.6427632	6.86	0.8	37.6
03/24/2023	05 56 49.096	25 35 24.48	1.3744987	1.6434192	6.81	0.9	37.6
03/25/2023	05 58 56.993	25 34 51.99	1.3844614	1.6440663	6.76	0.9	37.6
03/26/2023	06 01 05.580	25 34 13.18	1.3944112	1.6447044	6.72	0.9	37.5
03/27/2023	06 03 14.834	25 33 27.96	1.4043473	1.6453337	6.67	0.9	37.5
03/28/2023	06 05 24.732	25 32 36.24	1.4142687	1.6459539	6.62	0.9	37.4
03/29/2023	06 07 35.249	25 31 37.91	1.4241745	1.6465652	6.58	0.9	37.4
03/30/2023	06 09 46.363	25 30 32.89	1.4340641	1.6471674	6.53	0.9	37.3
03/31/2023	06 11 58.053	25 29 21.08	1.4439368	1.6477606	6.49	1.0	37.2
04/01/2023	06 14 10.297	25 28 02.39	1.4537918	1.6483447	6.44	1.0	37.2
04/02/2023	06 16 23.076	25 26 36.74	1.4636286	1.6489196	6.40	1.0	37.1
04/03/2023	06 18 36.369	25 25 04.04	1.4734467	1.6494854	6.36	1.0	37.0
04/04/2023	06 20 50.160	25 23 24.20	1.4832454	1.6500421	6.31	1.0	36.9
04/05/2023	06 23 04.431	25 21 37.16	1.4930245	1.6505895	6.27	1.0	36.8
04/06/2023	06 25 19.167	25 19 42.85	1.5027834	1.6511277	6.23	1.0	36.8
04/07/2023	06 27 34.354	25 17 41.20	1.5125217	1.6516566	6.19	1.1	36.7
04/08/2023	06 29 49.977	25 15 32.15	1.5222392	1.6521763	6.15	1.1	36.6
04/09/2023	06 32 06.024	25 13 15.65	1.5319354	1.6526866	6.11	1.1	36.6

## Mars - Apparent data

Date 0 h TT	Right Ascension			Declination			Earth	Solar	Equatorial	Mag.	Phase Angle deg.
	h	m	s	d	m	s	Distance au	Distance au	Diameter arc sec		
04/10/2023	06	34	22.482	25	10	51.66	1.5416099	1.6531876	6.08	1.1	36.5
04/11/2023	06	36	39.338	25	08	20.14	1.5512624	1.6536793	6.04	1.1	36.4
04/12/2023	06	38	56.579	25	05	41.04	1.5608924	1.6541616	6.00	1.1	36.4
04/13/2023	06	41	14.191	25	02	54.32	1.5704992	1.6546344	5.96	1.1	36.3
04/14/2023	06	43	32.162	24	59	59.94	1.5800824	1.6550979	5.93	1.2	36.2
04/15/2023	06	45	50.479	24	56	57.83	1.5896412	1.6555519	5.89	1.2	36.2
04/16/2023	06	48	09.131	24	53	47.93	1.5991748	1.6559964	5.86	1.2	36.1
04/17/2023	06	50	28.106	24	50	30.20	1.6086823	1.6564314	5.82	1.2	36.0
04/18/2023	06	52	47.395	24	47	04.57	1.6181629	1.6568569	5.79	1.2	36.0
04/19/2023	06	55	06.988	24	43	30.99	1.6276155	1.6572729	5.75	1.2	35.9
04/20/2023	06	57	26.873	24	39	49.44	1.6370392	1.6576794	5.72	1.2	35.8
04/21/2023	06	59	47.038	24	35	59.88	1.6464330	1.6580762	5.69	1.2	35.7
04/22/2023	07	02	07.471	24	32	02.29	1.6557961	1.6584635	5.66	1.3	35.6
04/23/2023	07	04	28.155	24	27	56.66	1.6651277	1.6588412	5.62	1.3	35.5
04/24/2023	07	06	49.076	24	23	42.98	1.6744270	1.6592092	5.59	1.3	35.4
04/25/2023	07	09	10.218	24	19	21.23	1.6836933	1.6595676	5.56	1.3	35.3
04/26/2023	07	11	31.564	24	14	51.40	1.6929260	1.6599163	5.53	1.3	35.2
04/27/2023	07	13	53.099	24	10	13.49	1.7021247	1.6602554	5.50	1.3	35.1
04/28/2023	07	16	14.811	24	05	27.47	1.7112889	1.6605847	5.47	1.3	34.9
04/29/2023	07	18	36.684	24	00	33.34	1.7204180	1.6609044	5.44	1.3	34.8
04/30/2023	07	20	58.706	23	55	31.10	1.7295118	1.6612143	5.41	1.3	34.7
05/01/2023	07	23	20.865	23	50	20.72	1.7385699	1.6615145	5.39	1.3	34.5
05/02/2023	07	25	43.151	23	45	02.21	1.7475920	1.6618049	5.36	1.4	34.4
05/03/2023	07	28	05.553	23	39	35.57	1.7565779	1.6620856	5.33	1.4	34.3
05/04/2023	07	30	28.063	23	34	00.80	1.7655274	1.6623565	5.30	1.4	34.2
05/05/2023	07	32	50.672	23	28	17.91	1.7744404	1.6626176	5.28	1.4	34.0
05/06/2023	07	35	13.372	23	22	26.90	1.7833166	1.6628689	5.25	1.4	33.9
05/07/2023	07	37	36.156	23	16	27.81	1.7921561	1.6631104	5.23	1.4	33.8
05/08/2023	07	39	59.017	23	10	20.64	1.8009587	1.6633420	5.20	1.4	33.7
05/09/2023	07	42	21.948	23	04	05.42	1.8097242	1.6635638	5.17	1.4	33.6
05/10/2023	07	44	44.939	22	57	42.18	1.8184524	1.6637758	5.15	1.4	33.5
05/11/2023	07	47	07.985	22	51	10.93	1.8271430	1.6639779	5.13	1.4	33.4
05/12/2023	07	49	31.078	22	44	31.66	1.8357956	1.6641702	5.10	1.4	33.3
05/13/2023	07	51	54.212	22	37	44.40	1.8444098	1.6643526	5.08	1.5	33.1
05/14/2023	07	54	17.382	22	30	49.12	1.8529849	1.6645251	5.05	1.5	33.0
05/15/2023	07	56	40.585	22	23	45.84	1.8615203	1.6646877	5.03	1.5	32.9
05/16/2023	07	59	03.816	22	16	34.56	1.8700153	1.6648404	5.01	1.5	32.8
05/17/2023	08	01	27.072	22	09	15.29	1.8784692	1.6649832	4.99	1.5	32.7
05/18/2023	08	03	50.348	22	01	48.06	1.8868812	1.6651161	4.96	1.5	32.6
05/19/2023	08	06	13.638	21	54	12.89	1.8952506	1.6652390	4.94	1.5	32.5
05/20/2023	08	08	36.935	21	46	29.83	1.9035767	1.6653521	4.92	1.5	32.3
05/21/2023	08	11	00.230	21	38	38.92	1.9118590	1.6654552	4.90	1.5	32.2
05/22/2023	08	13	23.515	21	30	40.20	1.9200967	1.6655484	4.88	1.5	32.0
05/23/2023	08	15	46.780	21	22	33.71	1.9282893	1.6656316	4.86	1.5	31.9
05/24/2023	08	18	10.016	21	14	19.51	1.9364365	1.6657050	4.84	1.5	31.8
05/25/2023	08	20	33.216	21	05	57.62	1.9445379	1.6657683	4.82	1.5	31.6
05/26/2023	08	22	56.371	20	57	28.10	1.9525930	1.6658217	4.80	1.6	31.4
05/27/2023	08	25	19.475	20	48	50.99	1.9606015	1.6658652	4.78	1.6	31.3
05/28/2023	08	27	42.522	20	40	06.32	1.9685633	1.6658987	4.76	1.6	31.1
05/29/2023	08	30	05.506	20	31	14.14	1.9764782	1.6659223	4.74	1.6	31.0

## Mars - Apparent data

Date 0 h TT	Right Ascension			Declination			Earth	Solar	Equatorial	Mag.	Phase Angle deg.
	h	m	s	d	m	s	Distance au	Distance au	Diameter arc sec		
05/30/2023	08	32	28.422	20	22	14.49	1.9843459	1.6659359	4.72	1.6	30.8
05/31/2023	08	34	51.266	20	13	07.43	1.9921664	1.6659396	4.70	1.6	30.6
06/01/2023	08	37	14.036	20	03	52.99	1.9999396	1.6659333	4.68	1.6	30.5
06/02/2023	08	39	36.728	19	54	31.23	2.0076656	1.6659170	4.66	1.6	30.3
06/03/2023	08	41	59.340	19	45	02.21	2.0153443	1.6658908	4.65	1.6	30.2
06/04/2023	08	44	21.871	19	35	25.99	2.0229758	1.6658547	4.63	1.6	30.0
06/05/2023	08	46	44.316	19	25	42.62	2.0305603	1.6658086	4.61	1.6	29.9
06/06/2023	08	49	06.674	19	15	52.17	2.0380976	1.6657526	4.60	1.6	29.8
06/07/2023	08	51	28.942	19	05	54.70	2.0455879	1.6656866	4.58	1.6	29.6
06/08/2023	08	53	51.116	18	55	50.25	2.0530310	1.6656106	4.56	1.6	29.5
06/09/2023	08	56	13.197	18	45	38.87	2.0604267	1.6655248	4.55	1.6	29.4
06/10/2023	08	58	35.185	18	35	20.57	2.0677747	1.6654290	4.53	1.6	29.2
06/11/2023	09	00	57.081	18	24	55.39	2.0750745	1.6653232	4.51	1.7	29.1
06/12/2023	09	03	18.887	18	14	23.37	2.0823256	1.6652076	4.50	1.7	29.0
06/13/2023	09	05	40.605	18	03	44.54	2.0895276	1.6650820	4.48	1.7	28.8
06/14/2023	09	08	02.237	17	52	58.95	2.0966799	1.6649465	4.47	1.7	28.7
06/15/2023	09	10	23.782	17	42	06.66	2.1037819	1.6648011	4.45	1.7	28.5
06/16/2023	09	12	45.239	17	31	07.73	2.1108330	1.6646458	4.44	1.7	28.4
06/17/2023	09	15	06.607	17	20	02.23	2.1178326	1.6644806	4.42	1.7	28.2
06/18/2023	09	17	27.882	17	08	50.22	2.1247803	1.6643056	4.41	1.7	28.1
06/19/2023	09	19	49.063	16	57	31.79	2.1316756	1.6641206	4.39	1.7	27.9
06/20/2023	09	22	10.145	16	46	06.99	2.1385181	1.6639258	4.38	1.7	27.8
06/21/2023	09	24	31.125	16	34	35.91	2.1453074	1.6637211	4.37	1.7	27.6
06/22/2023	09	26	52.002	16	22	58.62	2.1520432	1.6635066	4.35	1.7	27.4
06/23/2023	09	29	12.773	16	11	15.17	2.1587253	1.6632823	4.34	1.7	27.2
06/24/2023	09	31	33.436	15	59	25.65	2.1653534	1.6630481	4.33	1.7	27.1
06/25/2023	09	33	53.992	15	47	30.11	2.1719273	1.6628041	4.31	1.7	26.9
06/26/2023	09	36	14.440	15	35	28.63	2.1784470	1.6625503	4.30	1.7	26.7
06/27/2023	09	38	34.780	15	23	21.28	2.1849124	1.6622866	4.29	1.7	26.5
06/28/2023	09	40	55.014	15	11	08.11	2.1913235	1.6620133	4.27	1.7	26.3
06/29/2023	09	43	15.142	14	58	49.21	2.1976803	1.6617301	4.26	1.7	26.2
06/30/2023	09	45	35.166	14	46	24.65	2.2039829	1.6614372	4.25	1.7	26.0
07/01/2023	09	47	55.087	14	33	54.51	2.2102314	1.6611345	4.24	1.7	25.8
07/02/2023	09	50	14.908	14	21	18.85	2.2164260	1.6608222	4.23	1.7	25.7
07/03/2023	09	52	34.629	14	08	37.78	2.2225670	1.6605001	4.21	1.7	25.5
07/04/2023	09	54	54.251	13	55	51.35	2.2286546	1.6601683	4.20	1.7	25.3
07/05/2023	09	57	13.774	13	42	59.66	2.2346888	1.6598268	4.19	1.7	25.2
07/06/2023	09	59	33.201	13	30	02.76	2.2406698	1.6594757	4.18	1.7	25.0
07/07/2023	10	01	52.536	13	17	00.69	2.2465974	1.6591149	4.17	1.7	24.9
07/08/2023	10	04	11.783	13	03	53.51	2.2524716	1.6587445	4.16	1.8	24.7
07/09/2023	10	06	30.949	12	50	41.25	2.2582921	1.6583644	4.15	1.8	24.6
07/10/2023	10	08	50.041	12	37	23.96	2.2640584	1.6579748	4.14	1.8	24.4
07/11/2023	10	11	09.064	12	24	01.70	2.2697702	1.6575756	4.13	1.8	24.3
07/12/2023	10	13	28.023	12	10	34.53	2.2754271	1.6571668	4.12	1.8	24.1
07/13/2023	10	15	46.922	11	57	02.51	2.2810286	1.6567485	4.11	1.8	24.0
07/14/2023	10	18	05.762	11	43	25.74	2.2865742	1.6563207	4.10	1.8	23.8
07/15/2023	10	20	24.546	11	29	44.27	2.2920635	1.6558834	4.09	1.8	23.6
07/16/2023	10	22	43.276	11	15	58.20	2.2974962	1.6554366	4.08	1.8	23.5
07/17/2023	10	25	01.951	11	02	07.62	2.3028717	1.6549804	4.07	1.8	23.3
07/18/2023	10	27	20.574	10	48	12.59	2.3081899	1.6545147	4.06	1.8	23.1

Mars - Apparent data

Date 0 h TT	Right Ascension			Declination			Earth	Solar	Equatorial	Mag.	Phase Angle deg.
	h	m	s	d	m	s	Distance au	Distance au	Diameter arc sec		
07/19/2023	10	29	39.146	10	34	13.22	2.3134504	1.6540396	4.05	1.8	22.9
07/20/2023	10	31	57.668	10	20	09.57	2.3186529	1.6535551	4.04	1.8	22.8
07/21/2023	10	34	16.143	10	06	01.73	2.3237974	1.6530612	4.03	1.8	22.6
07/22/2023	10	36	34.573	09	51	49.79	2.3288835	1.6525581	4.02	1.8	22.4
07/23/2023	10	38	52.962	09	37	33.81	2.3339113	1.6520456	4.01	1.8	22.2
07/24/2023	10	41	11.312	09	23	13.89	2.3388806	1.6515238	4.00	1.8	22.0
07/25/2023	10	43	29.628	09	08	50.09	2.3437914	1.6509927	4.00	1.8	21.8
07/26/2023	10	45	47.913	08	54	22.51	2.3486439	1.6504524	3.99	1.8	21.6
07/27/2023	10	48	06.172	08	39	51.22	2.3534380	1.6499029	3.98	1.8	21.4
07/28/2023	10	50	24.409	08	25	16.31	2.3581740	1.6493442	3.97	1.8	21.2
07/29/2023	10	52	42.628	08	10	37.86	2.3628521	1.6487763	3.96	1.8	21.0
07/30/2023	10	55	00.833	07	55	55.96	2.3674725	1.6481994	3.96	1.8	20.9
07/31/2023	10	57	19.025	07	41	10.72	2.3720356	1.6476133	3.95	1.8	20.7
08/01/2023	10	59	37.209	07	26	22.21	2.3765416	1.6470181	3.94	1.8	20.5
08/02/2023	11	01	55.388	07	11	30.52	2.3809910	1.6464139	3.93	1.8	20.3
08/03/2023	11	04	13.566	06	56	35.72	2.3853838	1.6458007	3.93	1.8	20.2
08/04/2023	11	06	31.751	06	41	37.87	2.3897201	1.6451785	3.92	1.8	20.0
08/05/2023	11	08	49.952	06	26	37.02	2.3940001	1.6445474	3.91	1.8	19.9
08/06/2023	11	11	08.178	06	11	33.22	2.3982236	1.6439073	3.91	1.8	19.7
08/07/2023	11	13	26.438	05	56	26.52	2.4023902	1.6432584	3.90	1.8	19.5
08/08/2023	11	15	44.740	05	41	17.00	2.4064999	1.6426005	3.89	1.8	19.4
08/09/2023	11	18	03.090	05	26	04.71	2.4105521	1.6419339	3.89	1.8	19.2
08/10/2023	11	20	21.494	05	10	49.74	2.4145466	1.6412585	3.88	1.8	19.1
08/11/2023	11	22	39.957	04	55	32.17	2.4184830	1.6405744	3.87	1.8	18.9
08/12/2023	11	24	58.482	04	40	12.09	2.4223609	1.6398815	3.87	1.8	18.7
08/13/2023	11	27	17.075	04	24	49.60	2.4261802	1.6391799	3.86	1.8	18.5
08/14/2023	11	29	35.738	04	09	24.79	2.4299405	1.6384697	3.85	1.8	18.3
08/15/2023	11	31	54.476	03	53	57.74	2.4336414	1.6377509	3.85	1.8	18.2
08/16/2023	11	34	13.292	03	38	28.55	2.4372829	1.6370235	3.84	1.8	18.0
08/17/2023	11	36	32.192	03	22	57.32	2.4408648	1.6362876	3.84	1.8	17.8
08/18/2023	11	38	51.180	03	07	24.13	2.4443868	1.6355432	3.83	1.8	17.6
08/19/2023	11	41	10.262	02	51	49.08	2.4478489	1.6347903	3.83	1.8	17.4
08/20/2023	11	43	29.442	02	36	12.25	2.4512510	1.6340290	3.82	1.8	17.2
08/21/2023	11	45	48.726	02	20	33.74	2.4545932	1.6332594	3.82	1.8	17.0
08/22/2023	11	48	08.121	02	04	53.64	2.4578754	1.6324814	3.81	1.8	16.8
08/23/2023	11	50	27.631	01	49	12.04	2.4610979	1.6316951	3.81	1.8	16.6
08/24/2023	11	52	47.263	01	33	29.04	2.4642607	1.6309005	3.80	1.8	16.4
08/25/2023	11	55	07.022	01	17	44.74	2.4673640	1.6300977	3.80	1.8	16.2
08/26/2023	11	57	26.913	01	01	59.23	2.4704082	1.6292868	3.79	1.8	16.0
08/27/2023	11	59	46.940	00	46	12.61	2.4733936	1.6284677	3.79	1.8	15.8
08/28/2023	12	02	07.107	00	30	25.00	2.4763205	1.6276406	3.78	1.8	15.6
08/29/2023	12	04	27.419	00	14	36.50	2.4791895	1.6268054	3.78	1.8	15.4
08/30/2023	12	06	47.880	-00	01	12.81	2.4820008	1.6259622	3.77	1.8	15.2
08/31/2023	12	09	08.498	-00	17	02.82	2.4847549	1.6251111	3.77	1.8	15.1
09/01/2023	12	11	29.283	-00	32	53.47	2.4874521	1.6242521	3.77	1.8	14.9
09/02/2023	12	13	50.244	-00	48	44.69	2.4900924	1.6233852	3.76	1.8	14.7
09/03/2023	12	16	11.393	-01	04	36.42	2.4926760	1.6225105	3.76	1.8	14.6
09/04/2023	12	18	32.739	-01	20	28.59	2.4952028	1.6216281	3.75	1.8	14.4
09/05/2023	12	20	54.292	-01	36	21.12	2.4976726	1.6207379	3.75	1.8	14.2
09/06/2023	12	23	16.059	-01	52	13.94	2.5000851	1.6198401	3.75	1.8	14.1

## Mars - Apparent data

Date 0 h TT	Right Ascension			Declination			Earth	Solar	Equatorial	Mag.	Phase Angle deg.
	h	m	s	d	m	s	Distance au	Distance au	Diameter arc sec		
09/07/2023	12	25	38.047	-02	08	06.93	2.5024403	1.6189347	3.74	1.8	13.9
09/08/2023	12	28	00.262	-02	24	00.01	2.5047377	1.6180217	3.74	1.8	13.7
09/09/2023	12	30	22.708	-02	39	53.07	2.5069773	1.6171012	3.74	1.7	13.5
09/10/2023	12	32	45.393	-02	55	46.00	2.5091587	1.6161732	3.73	1.7	13.3
09/11/2023	12	35	08.320	-03	11	38.70	2.5112819	1.6152378	3.73	1.7	13.1
09/12/2023	12	37	31.496	-03	27	31.05	2.5133465	1.6142951	3.73	1.7	13.0
09/13/2023	12	39	54.927	-03	43	22.96	2.5153526	1.6133451	3.72	1.7	12.8
09/14/2023	12	42	18.618	-03	59	14.29	2.5172998	1.6123879	3.72	1.7	12.6
09/15/2023	12	44	42.577	-04	15	04.96	2.5191883	1.6114234	3.72	1.7	12.3
09/16/2023	12	47	06.809	-04	30	54.85	2.5210179	1.6104518	3.71	1.7	12.1
09/17/2023	12	49	31.322	-04	46	43.84	2.5227886	1.6094731	3.71	1.7	11.9
09/18/2023	12	51	56.122	-05	02	31.84	2.5245005	1.6084874	3.71	1.7	11.7
09/19/2023	12	54	21.215	-05	18	18.72	2.5261537	1.6074948	3.71	1.7	11.5
09/20/2023	12	56	46.607	-05	34	04.38	2.5277484	1.6064952	3.70	1.7	11.3
09/21/2023	12	59	12.305	-05	49	48.70	2.5292847	1.6054888	3.70	1.7	11.1
09/22/2023	13	01	38.314	-06	05	31.56	2.5307631	1.6044756	3.70	1.7	10.9
09/23/2023	13	04	04.637	-06	21	12.83	2.5321837	1.6034557	3.70	1.7	10.7
09/24/2023	13	06	31.281	-06	36	52.40	2.5335471	1.6024291	3.70	1.7	10.5
09/25/2023	13	08	58.248	-06	52	30.14	2.5348538	1.6013958	3.69	1.7	10.3
09/26/2023	13	11	25.544	-07	08	05.92	2.5361042	1.6003561	3.69	1.7	10.1
09/27/2023	13	13	53.175	-07	23	39.62	2.5372988	1.5993098	3.69	1.7	9.9
09/28/2023	13	16	21.149	-07	39	11.12	2.5384381	1.5982571	3.69	1.7	9.7
09/29/2023	13	18	49.477	-07	54	40.33	2.5395226	1.5971981	3.69	1.7	9.6
09/30/2023	13	21	18.167	-08	10	07.16	2.5405526	1.5961328	3.69	1.7	9.4
10/01/2023	13	23	47.233	-08	25	31.52	2.5415283	1.5950612	3.68	1.7	9.2
10/02/2023	13	26	16.683	-08	40	53.31	2.5424498	1.5939835	3.68	1.7	9.1
10/03/2023	13	28	46.527	-08	56	12.44	2.5433171	1.5928997	3.68	1.7	8.9
10/04/2023	13	31	16.770	-09	11	28.79	2.5441303	1.5918098	3.68	1.7	8.7
10/05/2023	13	33	47.421	-09	26	42.25	2.5448891	1.5907140	3.68	1.7	8.5
10/06/2023	13	36	18.484	-09	41	52.69	2.5455935	1.5896123	3.68	1.7	8.3
10/07/2023	13	38	49.965	-09	56	59.99	2.5462433	1.5885047	3.68	1.7	8.2
10/08/2023	13	41	21.869	-10	12	04.00	2.5468386	1.5873914	3.68	1.7	8.0
10/09/2023	13	43	54.204	-10	27	04.60	2.5473790	1.5862724	3.68	1.6	7.8
10/10/2023	13	46	26.974	-10	42	01.65	2.5478647	1.5851478	3.68	1.6	7.6
10/11/2023	13	49	00.186	-10	56	55.02	2.5482955	1.5840177	3.68	1.6	7.4
10/12/2023	13	51	33.845	-11	11	44.57	2.5486715	1.5828821	3.67	1.6	7.2
10/13/2023	13	54	07.958	-11	26	30.17	2.5489925	1.5817410	3.67	1.6	7.0
10/14/2023	13	56	42.532	-11	41	11.67	2.5492586	1.5805947	3.67	1.6	6.8
10/15/2023	13	59	17.571	-11	55	48.95	2.5494699	1.5794431	3.67	1.6	6.5
10/16/2023	14	01	53.083	-12	10	21.86	2.5496265	1.5782863	3.67	1.6	6.3
10/17/2023	14	04	29.071	-12	24	50.27	2.5497286	1.5771244	3.67	1.6	6.1
10/18/2023	14	07	05.541	-12	39	14.03	2.5497764	1.5759575	3.67	1.6	5.9
10/19/2023	14	09	42.496	-12	53	33.01	2.5497702	1.5747856	3.67	1.6	5.7
10/20/2023	14	12	19.939	-13	07	47.05	2.5497104	1.5736089	3.67	1.6	5.5
10/21/2023	14	14	57.874	-13	21	56.01	2.5495975	1.5724274	3.67	1.6	5.3
10/22/2023	14	17	36.301	-13	35	59.73	2.5494318	1.5712412	3.67	1.6	5.1
10/23/2023	14	20	15.225	-13	49	58.05	2.5492141	1.5700503	3.67	1.6	4.9
10/24/2023	14	22	54.648	-14	03	50.82	2.5489449	1.5688549	3.67	1.6	4.7
10/25/2023	14	25	34.576	-14	17	37.89	2.5486248	1.5676550	3.67	1.6	4.5
10/26/2023	14	28	15.015	-14	31	19.12	2.5482545	1.5664507	3.68	1.6	4.3

Mars - Apparent data

Date 0 h TT	Right Ascension			Declination			Earth	Solar	Equatorial	Mag.	Phase Angle deg.
	h	m	s	d	m	s	Distance au	Distance au	Diameter arc sec		
10/27/2023	14	30	55.973	-14	44	54.37	2.5478344	1.5652421	3.68	1.6	4.1
10/28/2023	14	33	37.460	-14	58	23.53	2.5473651	1.5640293	3.68	1.6	3.9
10/29/2023	14	36	19.482	-15	11	46.47	2.5468470	1.5628124	3.68	1.6	3.8
10/30/2023	14	39	02.047	-15	25	03.07	2.5462805	1.5615914	3.68	1.5	3.6
10/31/2023	14	41	45.160	-15	38	13.20	2.5456656	1.5603664	3.68	1.5	3.4
11/01/2023	14	44	28.826	-15	51	16.73	2.5450026	1.5591376	3.68	1.5	3.2
11/02/2023	14	47	13.048	-16	04	13.50	2.5442914	1.5579049	3.68	1.5	3.1
11/03/2023	14	49	57.829	-16	17	03.36	2.5435323	1.5566685	3.68	1.5	2.9
11/04/2023	14	52	43.173	-16	29	46.17	2.5427251	1.5554285	3.68	1.5	2.7
11/05/2023	14	55	29.082	-16	42	21.75	2.5418700	1.5541850	3.68	1.5	2.5
11/06/2023	14	58	15.560	-16	54	49.96	2.5409668	1.5529381	3.69	1.5	2.3
11/07/2023	15	01	02.609	-17	07	10.62	2.5400158	1.5516878	3.69	1.5	2.1
11/08/2023	15	03	50.232	-17	19	23.59	2.5390169	1.5504342	3.69	1.5	1.9
11/09/2023	15	06	38.433	-17	31	28.70	2.5379701	1.5491774	3.69	1.5	1.7
11/10/2023	15	09	27.214	-17	43	25.79	2.5368756	1.5479176	3.69	1.5	1.5
11/11/2023	15	12	16.577	-17	55	14.70	2.5357335	1.5466548	3.69	1.5	1.3
11/12/2023	15	15	06.524	-18	06	55.28	2.5345439	1.5453891	3.70	1.5	1.1
11/13/2023	15	17	57.057	-18	18	27.37	2.5333069	1.5441206	3.70	1.5	0.8
11/14/2023	15	20	48.175	-18	29	50.81	2.5320229	1.5428494	3.70	1.5	0.6
11/15/2023	15	23	39.878	-18	41	05.45	2.5306920	1.5415755	3.70	1.4	0.4
11/16/2023	15	26	32.164	-18	52	11.12	2.5293147	1.5402992	3.70	1.4	0.2
11/17/2023	15	29	25.029	-19	03	07.66	2.5278913	1.5390205	3.70	1.4	0.1
11/18/2023	15	32	18.470	-19	13	54.89	2.5264226	1.5377394	3.71	1.4	0.2
11/19/2023	15	35	12.484	-19	24	32.65	2.5249090	1.5364562	3.71	1.4	0.4
11/20/2023	15	38	07.068	-19	35	00.77	2.5233512	1.5351708	3.71	1.4	0.6
11/21/2023	15	41	02.221	-19	45	19.07	2.5217499	1.5338834	3.71	1.4	0.8
11/22/2023	15	43	57.942	-19	55	27.40	2.5201059	1.5325940	3.72	1.4	1.0
11/23/2023	15	46	54.233	-20	05	25.61	2.5184198	1.5313029	3.72	1.4	1.2
11/24/2023	15	49	51.094	-20	15	13.54	2.5166923	1.5300100	3.72	1.4	1.4
11/25/2023	15	52	48.529	-20	24	51.07	2.5149242	1.5287155	3.72	1.4	1.6
11/26/2023	15	55	46.537	-20	34	18.05	2.5131158	1.5274196	3.73	1.4	1.7
11/27/2023	15	58	45.117	-20	43	34.36	2.5112678	1.5261222	3.73	1.4	1.9
11/28/2023	16	01	44.269	-20	52	39.86	2.5093805	1.5248235	3.73	1.4	2.1
11/29/2023	16	04	43.989	-21	01	34.41	2.5074542	1.5235236	3.73	1.4	2.3
11/30/2023	16	07	44.274	-21	10	17.86	2.5054892	1.5222226	3.74	1.4	2.4
12/01/2023	16	10	45.120	-21	18	50.05	2.5034856	1.5209206	3.74	1.4	2.6
12/02/2023	16	13	46.523	-21	27	10.83	2.5014437	1.5196178	3.74	1.4	2.8
12/03/2023	16	16	48.479	-21	35	20.05	2.4993636	1.5183142	3.75	1.4	3.0
12/04/2023	16	19	50.984	-21	43	17.54	2.4972455	1.5170099	3.75	1.4	3.2
12/05/2023	16	22	54.034	-21	51	03.17	2.4950894	1.5157051	3.75	1.4	3.4
12/06/2023	16	25	57.624	-21	58	36.77	2.4928956	1.5143998	3.76	1.4	3.6
12/07/2023	16	29	01.750	-22	05	58.21	2.4906642	1.5130942	3.76	1.4	3.8
12/08/2023	16	32	06.405	-22	13	07.33	2.4883954	1.5117884	3.76	1.4	4.0
12/09/2023	16	35	11.586	-22	20	03.99	2.4860893	1.5104824	3.77	1.4	4.2
12/10/2023	16	38	17.284	-22	26	48.06	2.4837461	1.5091765	3.77	1.4	4.4
12/11/2023	16	41	23.493	-22	33	19.40	2.4813660	1.5078706	3.77	1.4	4.6
12/12/2023	16	44	30.204	-22	39	37.88	2.4789493	1.5065650	3.78	1.4	4.8
12/13/2023	16	47	37.406	-22	45	43.38	2.4764963	1.5052597	3.78	1.4	5.1
12/14/2023	16	50	45.088	-22	51	35.76	2.4740073	1.5039549	3.79	1.4	5.3
12/15/2023	16	53	53.237	-22	57	14.89	2.4714829	1.5026507	3.79	1.4	5.5

Mars - Apparent data

Date 0 h TT	Right Ascension			Declination			Earth	Solar	Equatorial	Mag.	Phase Angle deg.
	h	m	s	d	m	s	Distance au	Distance au	Diameter arc sec		
12/16/2023	16	57	01.839	-23	02	40.64	2.4689237	1.5013471	3.79	1.4	5.7
12/17/2023	17	00	10.882	-23	07	52.87	2.4663302	1.5000443	3.80	1.4	5.9
12/18/2023	17	03	20.355	-23	12	51.45	2.4637033	1.4987425	3.80	1.4	6.1
12/19/2023	17	06	30.247	-23	17	36.25	2.4610438	1.4974416	3.81	1.4	6.3
12/20/2023	17	09	40.550	-23	22	07.16	2.4583523	1.4961419	3.81	1.4	6.5
12/21/2023	17	12	51.257	-23	26	24.06	2.4556298	1.4948435	3.81	1.4	6.7
12/22/2023	17	16	02.359	-23	30	26.87	2.4528770	1.4935465	3.82	1.4	6.9
12/23/2023	17	19	13.848	-23	34	15.49	2.4500947	1.4922510	3.82	1.4	7.0
12/24/2023	17	22	25.715	-23	37	49.85	2.4472833	1.4909571	3.83	1.4	7.2
12/25/2023	17	25	37.949	-23	41	09.85	2.4444437	1.4896649	3.83	1.4	7.4
12/26/2023	17	28	50.540	-23	44	15.42	2.4415763	1.4883746	3.84	1.4	7.5
12/27/2023	17	32	03.476	-23	47	06.47	2.4386815	1.4870863	3.84	1.4	7.7
12/28/2023	17	35	16.745	-23	49	42.92	2.4357597	1.4858000	3.84	1.4	7.9
12/29/2023	17	38	30.335	-23	52	04.67	2.4328114	1.4845160	3.85	1.4	8.1
12/30/2023	17	41	44.234	-23	54	11.65	2.4298366	1.4832344	3.85	1.4	8.2
12/31/2023	17	44	58.429	-23	56	03.76	2.4268358	1.4819552	3.86	1.4	8.4
01/01/2024	17	48	12.910	-23	57	40.93	2.4238092	1.4806786	3.86	1.4	8.6
01/02/2024	17	51	27.663	-23	59	03.07	2.4207569	1.4794047	3.87	1.4	8.8



Jupiter - Apparent data

Date 0 h TT	Right Ascension			Declination			Earth	Solar	Equatorial	Mag.	Phase Angle deg.
	h	m	s	d	m	s	Distance au	Distance au	Diameter arc sec		
12/31/2022	00	05	59.634	-00	45	26.96	4.9946615	4.9511336	39.47	-2.4	11.4
01/01/2023	00	06	25.498	-00	42	22.62	5.0103772	4.9511219	39.35	-2.4	11.3
01/02/2023	00	06	51.955	-00	39	14.57	5.0260535	4.9511108	39.22	-2.4	11.3
01/03/2023	00	07	18.997	-00	36	02.86	5.0416871	4.9511003	39.10	-2.4	11.2
01/04/2023	00	07	46.616	-00	32	47.55	5.0572746	4.9510904	38.98	-2.4	11.2
01/05/2023	00	08	14.804	-00	29	28.68	5.0728127	4.9510810	38.86	-2.3	11.2
01/06/2023	00	08	43.553	-00	26	06.32	5.0882981	4.9510723	38.74	-2.3	11.1
01/07/2023	00	09	12.855	-00	22	40.53	5.1037277	4.9510641	38.63	-2.3	11.1
01/08/2023	00	09	42.702	-00	19	11.35	5.1190984	4.9510565	38.51	-2.3	11.0
01/09/2023	00	10	13.087	-00	15	38.84	5.1344069	4.9510495	38.40	-2.3	11.0
01/10/2023	00	10	44.003	-00	12	03.05	5.1496502	4.9510431	38.28	-2.3	10.9
01/11/2023	00	11	15.443	-00	08	24.03	5.1648252	4.9510373	38.17	-2.3	10.9
01/12/2023	00	11	47.401	-00	04	41.82	5.1799287	4.9510320	38.06	-2.3	10.8
01/13/2023	00	12	19.871	-00	00	56.46	5.1949577	4.9510273	37.95	-2.3	10.8
01/14/2023	00	12	52.848	00	02	52.02	5.2099091	4.9510232	37.84	-2.3	10.7
01/15/2023	00	13	26.328	00	06	43.56	5.2247797	4.9510197	37.73	-2.3	10.7
01/16/2023	00	14	00.304	00	10	38.14	5.2395664	4.9510168	37.63	-2.3	10.6
01/17/2023	00	14	34.772	00	14	35.73	5.2542660	4.9510144	37.52	-2.3	10.6
01/18/2023	00	15	09.726	00	18	36.28	5.2688753	4.9510127	37.42	-2.3	10.5
01/19/2023	00	15	45.161	00	22	39.75	5.2833911	4.9510115	37.31	-2.3	10.4
01/20/2023	00	16	21.068	00	26	46.09	5.2978100	4.9510109	37.21	-2.3	10.4
01/21/2023	00	16	57.438	00	30	55.23	5.3121287	4.9510109	37.11	-2.3	10.3
01/22/2023	00	17	34.261	00	35	07.11	5.3263438	4.9510115	37.01	-2.2	10.2
01/23/2023	00	18	11.529	00	39	21.67	5.3404522	4.9510126	36.92	-2.2	10.1
01/24/2023	00	18	49.233	00	43	38.84	5.3544507	4.9510144	36.82	-2.2	10.0
01/25/2023	00	19	27.366	00	47	58.56	5.3683363	4.9510167	36.72	-2.2	10.0
01/26/2023	00	20	05.922	00	52	20.81	5.3821063	4.9510196	36.63	-2.2	9.9
01/27/2023	00	20	44.897	00	56	45.53	5.3957579	4.9510231	36.54	-2.2	9.8
01/28/2023	00	21	24.284	01	01	12.67	5.4092887	4.9510272	36.45	-2.2	9.7
01/29/2023	00	22	04.076	01	05	42.19	5.4226963	4.9510318	36.36	-2.2	9.6
01/30/2023	00	22	44.266	01	10	14.04	5.4359785	4.9510370	36.27	-2.2	9.5
01/31/2023	00	23	24.848	01	14	48.16	5.4491331	4.9510429	36.18	-2.2	9.4
02/01/2023	00	24	05.813	01	19	24.51	5.4621580	4.9510493	36.09	-2.2	9.3
02/02/2023	00	24	47.154	01	24	03.01	5.4750511	4.9510563	36.01	-2.2	9.2
02/03/2023	00	25	28.864	01	28	43.62	5.4878104	4.9510638	35.92	-2.2	9.1
02/04/2023	00	26	10.934	01	33	26.29	5.5004338	4.9510720	35.84	-2.2	9.0
02/05/2023	00	26	53.359	01	38	10.97	5.5129196	4.9510807	35.76	-2.2	8.9
02/06/2023	00	27	36.132	01	42	57.59	5.5252657	4.9510900	35.68	-2.2	8.8
02/07/2023	00	28	19.247	01	47	46.13	5.5374703	4.9510999	35.60	-2.2	8.7
02/08/2023	00	29	02.698	01	52	36.53	5.5495314	4.9511104	35.52	-2.2	8.6
02/09/2023	00	29	46.480	01	57	28.75	5.5614472	4.9511215	35.45	-2.2	8.5
02/10/2023	00	30	30.589	02	02	22.77	5.5732157	4.9511331	35.37	-2.2	8.4
02/11/2023	00	31	15.020	02	07	18.54	5.5848351	4.9511454	35.30	-2.2	8.3
02/12/2023	00	31	59.770	02	12	16.04	5.5963034	4.9511582	35.23	-2.1	8.2
02/13/2023	00	32	44.834	02	17	15.22	5.6076187	4.9511716	35.16	-2.1	8.1
02/14/2023	00	33	30.208	02	22	16.06	5.6187789	4.9511855	35.09	-2.1	8.0
02/15/2023	00	34	15.887	02	27	18.52	5.6297821	4.9512001	35.02	-2.1	7.8
02/16/2023	00	35	01.864	02	32	22.56	5.6406261	4.9512152	34.95	-2.1	7.7
02/17/2023	00	35	48.132	02	37	28.12	5.6513089	4.9512310	34.88	-2.1	7.6
02/18/2023	00	36	34.683	02	42	35.15	5.6618283	4.9512473	34.82	-2.1	7.5

Jupiter - Apparent data

Date 0 h TT	Right Ascension			Declination			Earth	Solar	Equatorial	Mag.	Phase Angle deg.
	h	m	s	d	m	s	Distance au	Distance au	Diameter arc sec		
02/19/2023	00	37	21.510	02	47	43.58	5.6721823	4.9512642	34.76	-2.1	7.4
02/20/2023	00	38	08.605	02	52	53.36	5.6823688	4.9512816	34.69	-2.1	7.2
02/21/2023	00	38	55.962	02	58	04.43	5.6923858	4.9512997	34.63	-2.1	7.1
02/22/2023	00	39	43.575	03	03	16.76	5.7022316	4.9513183	34.57	-2.1	7.0
02/23/2023	00	40	31.441	03	08	30.30	5.7119045	4.9513376	34.51	-2.1	6.8
02/24/2023	00	41	19.555	03	13	45.02	5.7214031	4.9513574	34.46	-2.1	6.7
02/25/2023	00	42	07.912	03	19	00.87	5.7307262	4.9513777	34.40	-2.1	6.6
02/26/2023	00	42	56.507	03	24	17.82	5.7398724	4.9513987	34.35	-2.1	6.4
02/27/2023	00	43	45.333	03	29	35.81	5.7488408	4.9514203	34.29	-2.1	6.3
02/28/2023	00	44	34.383	03	34	54.80	5.7576303	4.9514424	34.24	-2.1	6.2
03/01/2023	00	45	23.652	03	40	14.73	5.7662398	4.9514651	34.19	-2.1	6.0
03/02/2023	00	46	13.133	03	45	35.57	5.7746686	4.9514884	34.14	-2.1	5.9
03/03/2023	00	47	02.819	03	50	57.25	5.7829157	4.9515123	34.09	-2.1	5.8
03/04/2023	00	47	52.706	03	56	19.73	5.7909803	4.9515367	34.04	-2.1	5.6
03/05/2023	00	48	42.786	04	01	42.98	5.7988614	4.9515618	34.00	-2.1	5.5
03/06/2023	00	49	33.056	04	07	06.94	5.8065584	4.9515874	33.95	-2.1	5.4
03/07/2023	00	50	23.510	04	12	31.58	5.8140703	4.9516136	33.91	-2.1	5.2
03/08/2023	00	51	14.145	04	17	56.86	5.8213964	4.9516404	33.87	-2.1	5.1
03/09/2023	00	52	04.958	04	23	22.75	5.8285360	4.9516678	33.82	-2.1	5.0
03/10/2023	00	52	55.945	04	28	49.23	5.8354881	4.9516957	33.78	-2.1	4.8
03/11/2023	00	53	47.103	04	34	16.26	5.8422519	4.9517242	33.74	-2.1	4.7
03/12/2023	00	54	38.429	04	39	43.82	5.8488265	4.9517533	33.71	-2.1	4.6
03/13/2023	00	55	29.920	04	45	11.89	5.8552111	4.9517830	33.67	-2.1	4.4
03/14/2023	00	56	21.572	04	50	40.43	5.8614046	4.9518133	33.63	-2.1	4.3
03/15/2023	00	57	13.380	04	56	09.41	5.8674060	4.9518442	33.60	-2.1	4.2
03/16/2023	00	58	05.337	05	01	38.79	5.8732143	4.9518756	33.57	-2.1	4.0
03/17/2023	00	58	57.439	05	07	08.51	5.8788285	4.9519076	33.53	-2.1	3.9
03/18/2023	00	59	49.678	05	12	38.54	5.8842475	4.9519402	33.50	-2.1	3.7
03/19/2023	01	00	42.047	05	18	08.82	5.8894701	4.9519734	33.47	-2.1	3.6
03/20/2023	01	01	34.542	05	23	39.29	5.8944955	4.9520072	33.45	-2.1	3.5
03/21/2023	01	02	27.158	05	29	09.93	5.8993227	4.9520415	33.42	-2.1	3.3
03/22/2023	01	03	19.891	05	34	40.68	5.9039510	4.9520764	33.39	-2.1	3.1
03/23/2023	01	04	12.739	05	40	11.54	5.9083797	4.9521119	33.37	-2.1	3.0
03/24/2023	01	05	05.697	05	45	42.45	5.9126085	4.9521480	33.34	-2.1	2.8
03/25/2023	01	05	58.761	05	51	13.39	5.9166370	4.9521847	33.32	-2.1	2.7
03/26/2023	01	06	51.926	05	56	44.32	5.9204649	4.9522219	33.30	-2.1	2.5
03/27/2023	01	07	45.186	06	02	15.20	5.9240923	4.9522597	33.28	-2.1	2.4
03/28/2023	01	08	38.536	06	07	45.99	5.9275189	4.9522981	33.26	-2.1	2.2
03/29/2023	01	09	31.969	06	13	16.64	5.9307449	4.9523371	33.24	-2.1	2.1
03/30/2023	01	10	25.479	06	18	47.11	5.9337702	4.9523767	33.22	-2.1	1.9
03/31/2023	01	11	19.062	06	24	17.36	5.9365949	4.9524168	33.21	-2.1	1.8
04/01/2023	01	12	12.713	06	29	47.34	5.9392191	4.9524575	33.19	-2.1	1.6
04/02/2023	01	13	06.427	06	35	17.03	5.9416428	4.9524988	33.18	-2.1	1.5
04/03/2023	01	14	00.200	06	40	46.39	5.9438662	4.9525407	33.17	-2.1	1.4
04/04/2023	01	14	54.029	06	46	15.39	5.9458893	4.9525832	33.16	-2.1	1.2
04/05/2023	01	15	47.910	06	51	43.99	5.9477124	4.9526262	33.15	-2.1	1.1
04/06/2023	01	16	41.841	06	57	12.18	5.9493354	4.9526698	33.14	-2.1	0.9
04/07/2023	01	17	35.821	07	02	39.94	5.9507585	4.9527140	33.13	-2.1	0.8
04/08/2023	01	18	29.845	07	08	07.25	5.9519817	4.9527588	33.12	-2.1	0.7
04/09/2023	01	19	23.913	07	13	34.09	5.9530049	4.9528042	33.12	-2.1	0.5

Jupiter - Apparent data

Date 0 h TT	Right Ascension			Declination			Earth	Solar	Equatorial	Mag.	Phase Angle deg.
	h	m	s	d	m	s	Distance au	Distance au	Diameter arc sec		
04/10/2023	01	20	18.019	07	19	00.43	5.9538282	4.9528501	33.11	-2.1	0.4
04/11/2023	01	21	12.161	07	24	26.26	5.9544513	4.9528966	33.11	-2.1	0.3
04/12/2023	01	22	06.333	07	29	51.53	5.9548740	4.9529437	33.11	-2.1	0.2
04/13/2023	01	23	00.529	07	35	16.21	5.9550963	4.9529914	33.11	-2.1	0.2
04/14/2023	01	23	54.743	07	40	40.26	5.9551177	4.9530397	33.11	-2.1	0.3
04/15/2023	01	24	48.969	07	46	03.64	5.9549383	4.9530885	33.11	-2.1	0.5
04/16/2023	01	25	43.204	07	51	26.29	5.9545576	4.9531379	33.11	-2.1	0.6
04/17/2023	01	26	37.441	07	56	48.19	5.9539757	4.9531879	33.11	-2.1	0.7
04/18/2023	01	27	31.678	08	02	09.31	5.9531925	4.9532385	33.12	-2.1	0.9
04/19/2023	01	28	25.912	08	07	29.61	5.9522082	4.9532896	33.12	-2.1	1.0
04/20/2023	01	29	20.140	08	12	49.07	5.9510228	4.9533414	33.13	-2.1	1.2
04/21/2023	01	30	14.358	08	18	07.67	5.9496369	4.9533937	33.14	-2.1	1.4
04/22/2023	01	31	08.560	08	23	25.38	5.9480508	4.9534466	33.14	-2.1	1.5
04/23/2023	01	32	02.743	08	28	42.16	5.9462652	4.9535000	33.15	-2.1	1.7
04/24/2023	01	32	56.899	08	33	57.98	5.9442807	4.9535541	33.17	-2.1	1.8
04/25/2023	01	33	51.022	08	39	12.81	5.9420981	4.9536087	33.18	-2.1	2.0
04/26/2023	01	34	45.108	08	44	26.59	5.9397182	4.9536639	33.19	-2.0	2.1
04/27/2023	01	35	39.151	08	49	39.31	5.9371417	4.9537197	33.21	-2.0	2.3
04/28/2023	01	36	33.145	08	54	50.92	5.9343696	4.9537760	33.22	-2.0	2.4
04/29/2023	01	37	27.085	09	00	01.39	5.9314025	4.9538330	33.24	-2.0	2.5
04/30/2023	01	38	20.969	09	05	10.69	5.9282415	4.9538905	33.26	-2.1	2.7
05/01/2023	01	39	14.791	09	10	18.80	5.9248873	4.9539486	33.27	-2.1	2.8
05/02/2023	01	40	08.550	09	15	25.69	5.9213408	4.9540072	33.29	-2.1	3.0
05/03/2023	01	41	02.241	09	20	31.34	5.9176030	4.9540665	33.32	-2.1	3.1
05/04/2023	01	41	55.862	09	25	35.73	5.9136745	4.9541263	33.34	-2.1	3.2
05/05/2023	01	42	49.412	09	30	38.85	5.9095563	4.9541867	33.36	-2.1	3.4
05/06/2023	01	43	42.887	09	35	40.70	5.9052491	4.9542477	33.38	-2.1	3.5
05/07/2023	01	44	36.285	09	40	41.25	5.9007536	4.9543092	33.41	-2.1	3.7
05/08/2023	01	45	29.600	09	45	40.48	5.8960705	4.9543713	33.44	-2.1	3.8
05/09/2023	01	46	22.828	09	50	38.39	5.8912002	4.9544340	33.46	-2.1	3.9
05/10/2023	01	47	15.964	09	55	34.93	5.8861433	4.9544973	33.49	-2.1	4.1
05/11/2023	01	48	09.000	10	00	30.07	5.8809003	4.9545611	33.52	-2.1	4.2
05/12/2023	01	49	01.930	10	05	23.77	5.8754717	4.9546256	33.55	-2.1	4.3
05/13/2023	01	49	54.750	10	10	15.99	5.8698579	4.9546906	33.59	-2.1	4.5
05/14/2023	01	50	47.454	10	15	06.71	5.8640595	4.9547562	33.62	-2.1	4.6
05/15/2023	01	51	40.040	10	19	55.89	5.8580771	4.9548223	33.65	-2.1	4.8
05/16/2023	01	52	32.502	10	24	43.51	5.8519115	4.9548890	33.69	-2.1	4.9
05/17/2023	01	53	24.838	10	29	29.55	5.8455634	4.9549563	33.73	-2.1	5.1
05/18/2023	01	54	17.044	10	34	13.99	5.8390339	4.9550242	33.76	-2.1	5.2
05/19/2023	01	55	09.114	10	38	56.81	5.8323240	4.9550927	33.80	-2.1	5.4
05/20/2023	01	56	01.044	10	43	37.98	5.8254350	4.9551617	33.84	-2.1	5.5
05/21/2023	01	56	52.826	10	48	17.49	5.8183680	4.9552313	33.88	-2.1	5.6
05/22/2023	01	57	44.453	10	52	55.28	5.8111245	4.9553015	33.93	-2.1	5.8
05/23/2023	01	58	35.920	10	57	31.35	5.8037059	4.9553722	33.97	-2.1	5.9
05/24/2023	01	59	27.220	11	02	05.64	5.7961136	4.9554435	34.01	-2.1	6.0
05/25/2023	02	00	18.346	11	06	38.14	5.7883492	4.9555154	34.06	-2.1	6.2
05/26/2023	02	01	09.294	11	11	08.80	5.7804142	4.9555879	34.11	-2.1	6.3
05/27/2023	02	02	00.058	11	15	37.61	5.7723100	4.9556609	34.15	-2.1	6.4
05/28/2023	02	02	50.634	11	20	04.54	5.7640384	4.9557345	34.20	-2.1	6.5
05/29/2023	02	03	41.017	11	24	29.57	5.7556007	4.9558087	34.25	-2.1	6.7

Jupiter - Apparent data

Date 0 h TT	Right Ascension			Declination			Earth	Solar	Equatorial	Mag.	Phase Angle deg.
	h	m	s	d	m	s	Distance au	Distance au	Diameter arc sec		
05/30/2023	02	04	31.204	11	28	52.69	5.7469985	4.9558834	34.30	-2.1	6.8
05/31/2023	02	05	21.191	11	33	13.87	5.7382335	4.9559588	34.36	-2.1	6.9
06/01/2023	02	06	10.975	11	37	33.12	5.7293071	4.9560347	34.41	-2.1	7.0
06/02/2023	02	07	00.552	11	41	50.41	5.7202209	4.9561111	34.46	-2.1	7.1
06/03/2023	02	07	49.920	11	46	05.75	5.7109762	4.9561882	34.52	-2.1	7.3
06/04/2023	02	08	39.073	11	50	19.13	5.7015745	4.9562658	34.58	-2.1	7.4
06/05/2023	02	09	28.005	11	54	30.52	5.6920171	4.9563440	34.64	-2.1	7.5
06/06/2023	02	10	16.711	11	58	39.92	5.6823051	4.9564227	34.69	-2.1	7.6
06/07/2023	02	11	05.182	12	02	47.30	5.6724398	4.9565020	34.75	-2.1	7.7
06/08/2023	02	11	53.412	12	06	52.61	5.6624222	4.9565819	34.82	-2.1	7.8
06/09/2023	02	12	41.394	12	10	55.82	5.6522536	4.9566624	34.88	-2.1	8.0
06/10/2023	02	13	29.121	12	14	56.90	5.6419350	4.9567434	34.94	-2.1	8.1
06/11/2023	02	14	16.591	12	18	55.83	5.6314678	4.9568250	35.01	-2.1	8.2
06/12/2023	02	15	03.797	12	22	52.59	5.6208534	4.9569072	35.07	-2.1	8.3
06/13/2023	02	15	50.735	12	26	47.15	5.6100931	4.9569899	35.14	-2.1	8.4
06/14/2023	02	16	37.401	12	30	39.52	5.5991886	4.9570732	35.21	-2.1	8.5
06/15/2023	02	17	23.787	12	34	29.66	5.5881415	4.9571571	35.28	-2.1	8.6
06/16/2023	02	18	09.889	12	38	17.56	5.5769538	4.9572415	35.35	-2.2	8.8
06/17/2023	02	18	55.697	12	42	03.20	5.5656273	4.9573265	35.42	-2.2	8.9
06/18/2023	02	19	41.205	12	45	46.56	5.5541641	4.9574121	35.50	-2.2	9.0
06/19/2023	02	20	26.403	12	49	27.60	5.5425661	4.9574982	35.57	-2.2	9.1
06/20/2023	02	21	11.286	12	53	06.30	5.5308357	4.9575849	35.64	-2.2	9.2
06/21/2023	02	21	55.844	12	56	42.63	5.5189749	4.9576722	35.72	-2.2	9.3
06/22/2023	02	22	40.071	13	00	16.56	5.5069860	4.9577600	35.80	-2.2	9.4
06/23/2023	02	23	23.961	13	03	48.07	5.4948713	4.9578484	35.88	-2.2	9.5
06/24/2023	02	24	07.507	13	07	17.14	5.4826330	4.9579374	35.96	-2.2	9.6
06/25/2023	02	24	50.704	13	10	43.74	5.4702734	4.9580269	36.04	-2.2	9.7
06/26/2023	02	25	33.546	13	14	07.87	5.4577948	4.9581170	36.12	-2.2	9.7
06/27/2023	02	26	16.028	13	17	29.51	5.4451996	4.9582077	36.21	-2.2	9.8
06/28/2023	02	26	58.147	13	20	48.65	5.4324900	4.9582989	36.29	-2.2	9.9
06/29/2023	02	27	39.896	13	24	05.29	5.4196684	4.9583907	36.38	-2.2	10.0
06/30/2023	02	28	21.272	13	27	19.41	5.4067370	4.9584831	36.46	-2.2	10.1
07/01/2023	02	29	02.269	13	30	31.03	5.3936979	4.9585760	36.55	-2.2	10.1
07/02/2023	02	29	42.881	13	33	40.13	5.3805534	4.9586695	36.64	-2.2	10.2
07/03/2023	02	30	23.100	13	36	46.70	5.3673055	4.9587635	36.73	-2.2	10.3
07/04/2023	02	31	02.918	13	39	50.72	5.3539563	4.9588581	36.82	-2.2	10.4
07/05/2023	02	31	42.326	13	42	52.17	5.3405076	4.9589533	36.92	-2.2	10.4
07/06/2023	02	32	21.316	13	45	51.00	5.3269613	4.9590490	37.01	-2.2	10.5
07/07/2023	02	32	59.879	13	48	47.18	5.3133194	4.9591453	37.10	-2.2	10.6
07/08/2023	02	33	38.011	13	51	40.69	5.2995839	4.9592422	37.20	-2.3	10.7
07/09/2023	02	34	15.706	13	54	31.51	5.2857569	4.9593396	37.30	-2.3	10.7
07/10/2023	02	34	52.958	13	57	19.63	5.2718405	4.9594376	37.40	-2.3	10.8
07/11/2023	02	35	29.760	14	00	05.04	5.2578371	4.9595361	37.50	-2.3	10.9
07/12/2023	02	36	06.105	14	02	47.72	5.2437493	4.9596352	37.60	-2.3	11.0
07/13/2023	02	36	41.986	14	05	27.66	5.2295796	4.9597349	37.70	-2.3	11.0
07/14/2023	02	37	17.394	14	08	04.83	5.2153308	4.9598351	37.80	-2.3	11.1
07/15/2023	02	37	52.319	14	10	39.23	5.2010056	4.9599359	37.91	-2.3	11.1
07/16/2023	02	38	26.753	14	13	10.82	5.1866070	4.9600372	38.01	-2.3	11.2
07/17/2023	02	39	00.686	14	15	39.58	5.1721379	4.9601391	38.12	-2.3	11.3
07/18/2023	02	39	34.110	14	18	05.49	5.1576014	4.9602416	38.22	-2.3	11.3

Jupiter - Apparent data

Date 0 h TT	Right Ascension			Declination			Earth	Solar	Equatorial	Mag.	Phase Angle deg.
	h	m	s	d	m	s	Distance au	Distance au	Diameter arc sec		
07/19/2023	02	40	07.015	14	20	28.52	5.1430007	4.9603446	38.33	-2.3	11.4
07/20/2023	02	40	39.395	14	22	48.64	5.1283387	4.9604482	38.44	-2.3	11.4
07/21/2023	02	41	11.242	14	25	05.83	5.1136188	4.9605523	38.55	-2.3	11.4
07/22/2023	02	41	42.549	14	27	20.09	5.0988441	4.9606570	38.66	-2.3	11.5
07/23/2023	02	42	13.309	14	29	31.39	5.0840178	4.9607622	38.78	-2.3	11.5
07/24/2023	02	42	43.517	14	31	39.72	5.0691431	4.9608680	38.89	-2.3	11.5
07/25/2023	02	43	13.167	14	33	45.08	5.0542234	4.9609744	39.01	-2.3	11.6
07/26/2023	02	43	42.254	14	35	47.45	5.0392618	4.9610813	39.12	-2.4	11.6
07/27/2023	02	44	10.771	14	37	46.85	5.0242616	4.9611888	39.24	-2.4	11.6
07/28/2023	02	44	38.713	14	39	43.26	5.0092260	4.9612968	39.36	-2.4	11.6
07/29/2023	02	45	06.073	14	41	36.69	4.9941581	4.9614054	39.48	-2.4	11.6
07/30/2023	02	45	32.844	14	43	27.12	4.9790610	4.9615145	39.59	-2.4	11.7
07/31/2023	02	45	59.017	14	45	14.56	4.9639379	4.9616242	39.72	-2.4	11.7
08/01/2023	02	46	24.584	14	46	58.97	4.9487916	4.9617345	39.84	-2.4	11.7
08/02/2023	02	46	49.536	14	48	40.32	4.9336250	4.9618453	39.96	-2.4	11.7
08/03/2023	02	47	13.863	14	50	18.60	4.9184411	4.9619566	40.08	-2.4	11.7
08/04/2023	02	47	37.560	14	51	53.76	4.9032427	4.9620686	40.21	-2.4	11.7
08/05/2023	02	48	00.620	14	53	25.79	4.8880329	4.9621810	40.33	-2.4	11.7
08/06/2023	02	48	23.039	14	54	54.67	4.8728147	4.9622940	40.46	-2.4	11.7
08/07/2023	02	48	44.809	14	56	20.40	4.8575916	4.9624076	40.59	-2.4	11.8
08/08/2023	02	49	05.925	14	57	42.97	4.8423668	4.9625217	40.71	-2.4	11.8
08/09/2023	02	49	26.378	14	59	02.37	4.8271440	4.9626364	40.84	-2.4	11.8
08/10/2023	02	49	46.160	15	00	18.58	4.8119269	4.9627516	40.97	-2.5	11.8
08/11/2023	02	50	05.262	15	01	31.59	4.7967193	4.9628674	41.10	-2.5	11.7
08/12/2023	02	50	23.675	15	02	41.38	4.7815251	4.9629837	41.23	-2.5	11.7
08/13/2023	02	50	41.392	15	03	47.93	4.7663483	4.9631006	41.36	-2.5	11.7
08/14/2023	02	50	58.403	15	04	51.21	4.7511929	4.9632180	41.49	-2.5	11.7
08/15/2023	02	51	14.702	15	05	51.20	4.7360630	4.9633359	41.63	-2.5	11.7
08/16/2023	02	51	30.281	15	06	47.89	4.7209629	4.9634545	41.76	-2.5	11.7
08/17/2023	02	51	45.134	15	07	41.26	4.7058967	4.9635735	41.89	-2.5	11.6
08/18/2023	02	51	59.255	15	08	31.30	4.6908686	4.9636931	42.03	-2.5	11.6
08/19/2023	02	52	12.640	15	09	17.98	4.6758830	4.9638133	42.16	-2.5	11.5
08/20/2023	02	52	25.284	15	10	01.32	4.6609440	4.9639340	42.30	-2.5	11.5
08/21/2023	02	52	37.184	15	10	41.30	4.6460560	4.9640552	42.43	-2.5	11.5
08/22/2023	02	52	48.337	15	11	17.93	4.6312232	4.9641770	42.57	-2.5	11.4
08/23/2023	02	52	58.737	15	11	51.21	4.6164499	4.9642994	42.71	-2.5	11.3
08/24/2023	02	53	08.384	15	12	21.15	4.6017404	4.9644223	42.84	-2.6	11.3
08/25/2023	02	53	17.272	15	12	47.74	4.5870988	4.9645457	42.98	-2.6	11.2
08/26/2023	02	53	25.398	15	13	11.01	4.5725292	4.9646697	43.12	-2.6	11.2
08/27/2023	02	53	32.758	15	13	30.94	4.5580358	4.9647942	43.25	-2.6	11.1
08/28/2023	02	53	39.345	15	13	47.53	4.5436226	4.9649193	43.39	-2.6	11.0
08/29/2023	02	53	45.156	15	14	00.76	4.5292934	4.9650449	43.53	-2.6	11.0
08/30/2023	02	53	50.186	15	14	10.63	4.5150522	4.9651711	43.66	-2.6	10.9
08/31/2023	02	53	54.430	15	14	17.09	4.5009029	4.9652978	43.80	-2.6	10.8
09/01/2023	02	53	57.887	15	14	20.15	4.4868492	4.9654250	43.94	-2.6	10.7
09/02/2023	02	54	00.556	15	14	19.79	4.4728952	4.9655528	44.08	-2.6	10.7
09/03/2023	02	54	02.437	15	14	16.03	4.4590450	4.9656811	44.21	-2.6	10.6
09/04/2023	02	54	03.528	15	14	08.86	4.4453027	4.9658100	44.35	-2.6	10.5
09/05/2023	02	54	03.827	15	13	58.29	4.4316728	4.9659394	44.49	-2.6	10.4
09/06/2023	02	54	03.331	15	13	44.33	4.4181597	4.9660693	44.62	-2.6	10.3

Jupiter - Apparent data

Date 0 h TT	Right Ascension			Declination			Earth	Solar	Equatorial	Mag.	Phase Angle deg.
	h	m	s	d	m	s	Distance au	Distance au	Diameter arc sec		
09/07/2023	02	54	02.038	15	13	26.97	4.4047681	4.9661998	44.76	-2.7	10.3
09/08/2023	02	53	59.944	15	13	06.21	4.3915027	4.9663308	44.89	-2.7	10.2
09/09/2023	02	53	57.047	15	12	42.05	4.3783681	4.9664624	45.03	-2.7	10.1
09/10/2023	02	53	53.346	15	12	14.48	4.3653692	4.9665945	45.16	-2.7	9.9
09/11/2023	02	53	48.841	15	11	43.51	4.3525107	4.9667271	45.29	-2.7	9.8
09/12/2023	02	53	43.531	15	11	09.12	4.3397976	4.9668603	45.43	-2.7	9.7
09/13/2023	02	53	37.419	15	10	31.34	4.3272346	4.9669940	45.56	-2.7	9.6
09/14/2023	02	53	30.506	15	09	50.15	4.3148266	4.9671283	45.69	-2.7	9.5
09/15/2023	02	53	22.796	15	09	05.59	4.3025784	4.9672631	45.82	-2.7	9.4
09/16/2023	02	53	14.294	15	08	17.67	4.2904949	4.9673984	45.95	-2.7	9.2
09/17/2023	02	53	05.005	15	07	26.40	4.2785807	4.9675343	46.08	-2.7	9.1
09/18/2023	02	52	54.935	15	06	31.83	4.2668406	4.9676707	46.20	-2.7	8.9
09/19/2023	02	52	44.090	15	05	33.98	4.2552793	4.9678076	46.33	-2.7	8.8
09/20/2023	02	52	32.478	15	04	32.88	4.2439013	4.9679451	46.45	-2.7	8.7
09/21/2023	02	52	20.104	15	03	28.59	4.2327111	4.9680831	46.58	-2.7	8.5
09/22/2023	02	52	06.977	15	02	21.13	4.2217131	4.9682216	46.70	-2.8	8.3
09/23/2023	02	51	53.103	15	01	10.54	4.2109116	4.9683607	46.82	-2.8	8.2
09/24/2023	02	51	38.488	14	59	56.86	4.2003107	4.9685003	46.94	-2.8	8.0
09/25/2023	02	51	23.139	14	58	40.10	4.1899145	4.9686404	47.05	-2.8	7.9
09/26/2023	02	51	07.064	14	57	20.29	4.1797269	4.9687811	47.17	-2.8	7.7
09/27/2023	02	50	50.271	14	55	57.46	4.1697518	4.9689223	47.28	-2.8	7.6
09/28/2023	02	50	32.769	14	54	31.62	4.1599927	4.9690640	47.39	-2.8	7.4
09/29/2023	02	50	14.571	14	53	02.82	4.1504536	4.9692063	47.50	-2.8	7.2
09/30/2023	02	49	55.689	14	51	31.09	4.1411382	4.9693490	47.61	-2.8	7.1
10/01/2023	02	49	36.135	14	49	56.49	4.1320502	4.9694924	47.71	-2.8	6.9
10/02/2023	02	49	15.921	14	48	19.07	4.1231935	4.9696362	47.81	-2.8	6.7
10/03/2023	02	48	55.058	14	46	38.89	4.1145722	4.9697806	47.91	-2.8	6.6
10/04/2023	02	48	33.558	14	44	55.99	4.1061902	4.9699255	48.01	-2.8	6.4
10/05/2023	02	48	11.431	14	43	10.42	4.0980515	4.9700709	48.11	-2.8	6.2
10/06/2023	02	47	48.689	14	41	22.24	4.0901602	4.9702169	48.20	-2.8	6.0
10/07/2023	02	47	25.345	14	39	31.49	4.0825202	4.9703634	48.29	-2.8	5.8
10/08/2023	02	47	01.413	14	37	38.22	4.0751354	4.9705104	48.38	-2.8	5.6
10/09/2023	02	46	36.909	14	35	42.50	4.0680097	4.9706580	48.46	-2.8	5.5
10/10/2023	02	46	11.848	14	33	44.38	4.0611468	4.9708061	48.54	-2.9	5.3
10/11/2023	02	45	46.249	14	31	43.94	4.0545504	4.9709547	48.62	-2.9	5.1
10/12/2023	02	45	20.129	14	29	41.24	4.0482240	4.9711038	48.70	-2.9	4.8
10/13/2023	02	44	53.509	14	27	36.37	4.0421712	4.9712534	48.77	-2.9	4.6
10/14/2023	02	44	26.408	14	25	29.41	4.0363951	4.9714036	48.84	-2.9	4.4
10/15/2023	02	43	58.849	14	23	20.46	4.0308991	4.9715543	48.91	-2.9	4.2
10/16/2023	02	43	30.853	14	21	09.62	4.0256860	4.9717056	48.97	-2.9	4.0
10/17/2023	02	43	02.443	14	18	56.98	4.0207587	4.9718573	49.03	-2.9	3.8
10/18/2023	02	42	33.639	14	16	42.66	4.0161199	4.9720096	49.09	-2.9	3.6
10/19/2023	02	42	04.466	14	14	26.75	4.0117720	4.9721624	49.14	-2.9	3.3
10/20/2023	02	41	34.944	14	12	09.36	4.0077172	4.9723157	49.19	-2.9	3.1
10/21/2023	02	41	05.094	14	09	50.59	4.0039575	4.9724696	49.24	-2.9	2.9
10/22/2023	02	40	34.939	14	07	30.53	4.0004949	4.9726239	49.28	-2.9	2.7
10/23/2023	02	40	04.499	14	05	09.27	3.9973307	4.9727788	49.32	-2.9	2.5
10/24/2023	02	39	33.798	14	02	46.91	3.9944666	4.9729342	49.35	-2.9	2.2
10/25/2023	02	39	02.858	14	00	23.54	3.9919037	4.9730902	49.39	-2.9	2.0
10/26/2023	02	38	31.704	13	57	59.25	3.9896432	4.9732466	49.41	-2.9	1.8

Jupiter - Apparent data

Date 0 h TT	Right Ascension			Declination			Earth	Solar	Equatorial	Mag.	Phase Angle deg.
	h	m	s	d	m	s	Distance au	Distance au	Diameter arc sec		
10/27/2023	02	38	00.361	13	55	34.15	3.9876862	4.9734036	49.44	-2.9	1.6
10/28/2023	02	37	28.854	13	53	08.36	3.9860336	4.9735611	49.46	-2.9	1.4
10/29/2023	02	36	57.208	13	50	42.00	3.9846864	4.9737191	49.48	-2.9	1.2
10/30/2023	02	36	25.447	13	48	15.17	3.9836456	4.9738776	49.49	-2.9	1.0
10/31/2023	02	35	53.594	13	45	47.99	3.9829121	4.9740367	49.50	-2.9	0.8
11/01/2023	02	35	21.671	13	43	20.58	3.9824867	4.9741963	49.50	-2.9	0.6
11/02/2023	02	34	49.699	13	40	53.03	3.9823703	4.9743563	49.50	-2.9	0.4
11/03/2023	02	34	17.701	13	38	25.47	3.9825636	4.9745169	49.50	-2.9	0.3
11/04/2023	02	33	45.702	13	35	57.98	3.9830671	4.9746781	49.50	-2.9	0.3
11/05/2023	02	33	13.723	13	33	30.69	3.9838812	4.9748397	49.49	-2.9	0.5
11/06/2023	02	32	41.791	13	31	03.71	3.9850063	4.9750019	49.47	-2.9	0.7
11/07/2023	02	32	09.930	13	28	37.15	3.9864425	4.9751645	49.45	-2.9	0.9
11/08/2023	02	31	38.166	13	26	11.13	3.9881897	4.9753277	49.43	-2.9	1.1
11/09/2023	02	31	06.524	13	23	45.79	3.9902476	4.9754914	49.41	-2.9	1.4
11/10/2023	02	30	35.031	13	21	21.23	3.9926159	4.9756556	49.38	-2.9	1.6
11/11/2023	02	30	03.713	13	18	57.61	3.9952940	4.9758203	49.34	-2.9	1.8
11/12/2023	02	29	32.597	13	16	35.04	3.9982811	4.9759856	49.31	-2.9	2.0
11/13/2023	02	29	01.708	13	14	13.67	4.0015761	4.9761513	49.27	-2.9	2.3
11/14/2023	02	28	31.071	13	11	53.63	4.0051778	4.9763176	49.22	-2.9	2.5
11/15/2023	02	28	00.712	13	09	35.05	4.0090848	4.9764844	49.17	-2.9	2.7
11/16/2023	02	27	30.653	13	07	18.06	4.0132954	4.9766516	49.12	-2.9	2.9
11/17/2023	02	27	00.916	13	05	02.77	4.0178076	4.9768194	49.07	-2.9	3.2
11/18/2023	02	26	31.522	13	02	49.29	4.0226192	4.9769878	49.01	-2.9	3.4
11/19/2023	02	26	02.492	13	00	37.73	4.0277279	4.9771566	48.95	-2.9	3.6
11/20/2023	02	25	33.848	12	58	28.18	4.0331312	4.9773259	48.88	-2.9	3.8
11/21/2023	02	25	05.609	12	56	20.75	4.0388263	4.9774957	48.81	-2.9	4.0
11/22/2023	02	24	37.797	12	54	15.52	4.0448104	4.9776661	48.74	-2.9	4.2
11/23/2023	02	24	10.432	12	52	12.60	4.0510807	4.9778369	48.66	-2.9	4.4
11/24/2023	02	23	43.537	12	50	12.10	4.0576343	4.9780083	48.59	-2.9	4.6
11/25/2023	02	23	17.129	12	48	14.12	4.0644681	4.9781802	48.50	-2.9	4.8
11/26/2023	02	22	51.229	12	46	18.76	4.0715793	4.9783525	48.42	-2.8	5.0
11/27/2023	02	22	25.852	12	44	26.11	4.0789649	4.9785254	48.33	-2.8	5.2
11/28/2023	02	22	01.015	12	42	36.27	4.0866218	4.9786988	48.24	-2.8	5.4
11/29/2023	02	21	36.731	12	40	49.32	4.0945471	4.9788727	48.15	-2.8	5.6
11/30/2023	02	21	13.016	12	39	05.33	4.1027378	4.9790471	48.05	-2.8	5.8
12/01/2023	02	20	49.882	12	37	24.38	4.1111908	4.9792220	47.95	-2.8	5.9
12/02/2023	02	20	27.344	12	35	46.54	4.1199027	4.9793974	47.85	-2.8	6.1
12/03/2023	02	20	05.417	12	34	11.88	4.1288705	4.9795734	47.75	-2.8	6.3
12/04/2023	02	19	44.115	12	32	40.47	4.1380905	4.9797498	47.64	-2.8	6.5
12/05/2023	02	19	23.452	12	31	12.39	4.1475594	4.9799267	47.53	-2.8	6.7
12/06/2023	02	19	03.443	12	29	47.71	4.1572735	4.9801041	47.42	-2.8	6.8
12/07/2023	02	18	44.101	12	28	26.50	4.1672291	4.9802821	47.31	-2.8	7.0
12/08/2023	02	18	25.441	12	27	08.84	4.1774223	4.9804605	47.19	-2.8	7.2
12/09/2023	02	18	07.476	12	25	54.80	4.1878492	4.9806394	47.08	-2.8	7.4
12/10/2023	02	17	50.219	12	24	44.45	4.1985056	4.9808188	46.96	-2.8	7.5
12/11/2023	02	17	33.682	12	23	37.86	4.2093874	4.9809988	46.83	-2.8	7.7
12/12/2023	02	17	17.876	12	22	35.10	4.2204901	4.9811792	46.71	-2.7	7.9
12/13/2023	02	17	02.810	12	21	36.23	4.2318094	4.9813601	46.59	-2.7	8.0
12/14/2023	02	16	48.492	12	20	41.30	4.2433403	4.9815416	46.46	-2.7	8.2
12/15/2023	02	16	34.930	12	19	50.33	4.2550783	4.9817235	46.33	-2.7	8.3

Jupiter - Apparent data

Date 0 h TT	Right Ascension			Declination			Earth	Solar	Equatorial	Mag.	Phase Angle deg.
	h	m	s	d	m	s	Distance au	Distance au	Diameter arc sec		
12/16/2023	02	16	22.128	12	19	03.37	4.2670183	4.9819059	46.20	-2.7	8.5
12/17/2023	02	16	10.093	12	18	20.43	4.2791552	4.9820888	46.07	-2.7	8.6
12/18/2023	02	15	58.830	12	17	41.53	4.2914841	4.9822723	45.94	-2.7	8.8
12/19/2023	02	15	48.346	12	17	06.69	4.3039998	4.9824562	45.81	-2.7	8.9
12/20/2023	02	15	38.646	12	16	35.93	4.3166972	4.9826406	45.67	-2.7	9.0
12/21/2023	02	15	29.736	12	16	09.28	4.3295714	4.9828255	45.53	-2.7	9.1
12/22/2023	02	15	21.621	12	15	46.75	4.3426175	4.9830109	45.40	-2.7	9.3
12/23/2023	02	15	14.304	12	15	28.38	4.3558305	4.9831968	45.26	-2.7	9.4
12/24/2023	02	15	07.789	12	15	14.17	4.3692056	4.9833832	45.12	-2.7	9.5
12/25/2023	02	15	02.076	12	15	04.13	4.3827383	4.9835701	44.98	-2.7	9.6
12/26/2023	02	14	57.165	12	14	58.26	4.3964237	4.9837575	44.84	-2.7	9.7
12/27/2023	02	14	53.056	12	14	56.57	4.4102575	4.9839453	44.70	-2.6	9.8
12/28/2023	02	14	49.748	12	14	59.03	4.4242350	4.9841337	44.56	-2.6	9.9
12/29/2023	02	14	47.240	12	15	05.65	4.4383516	4.9843226	44.42	-2.6	10.0
12/30/2023	02	14	45.533	12	15	16.41	4.4526029	4.9845119	44.28	-2.6	10.1
12/31/2023	02	14	44.626	12	15	31.29	4.4669843	4.9847018	44.13	-2.6	10.2
01/01/2024	02	14	44.520	12	15	50.30	4.4814913	4.9848921	43.99	-2.6	10.3
01/02/2024	02	14	45.215	12	16	13.42	4.4961192	4.9850829	43.85	-2.6	10.4



Saturn - Apparent data

Date	Right Ascension			Declination			Earth	Solar	Equatorial	Mag.	Phase
0 h TT	h	m	s	d	m	s	Distance	Distance	Diameter		Angle
							au	au	arc sec		deg.
12/31/2022	21	40	23.088	-15	14	51.14	10.5312757	9.8358405	15.78	0.8	3.9
01/01/2023	21	40	46.407	-15	12	53.48	10.5424747	9.8355894	15.76	0.8	3.8
01/02/2023	21	41	09.934	-15	10	54.68	10.5534752	9.8353382	15.75	0.8	3.7
01/03/2023	21	41	33.665	-15	08	54.78	10.5642748	9.8350869	15.73	0.8	3.7
01/04/2023	21	41	57.595	-15	06	53.80	10.5748713	9.8348355	15.72	0.8	3.6
01/05/2023	21	42	21.720	-15	04	51.76	10.5852625	9.8345840	15.70	0.8	3.5
01/06/2023	21	42	46.033	-15	02	48.69	10.5954462	9.8343324	15.69	0.8	3.5
01/07/2023	21	43	10.530	-15	00	44.62	10.6054201	9.8340806	15.67	0.8	3.4
01/08/2023	21	43	35.205	-14	58	39.57	10.6151821	9.8338288	15.66	0.8	3.3
01/09/2023	21	44	00.052	-14	56	33.56	10.6247300	9.8335769	15.64	0.8	3.2
01/10/2023	21	44	25.067	-14	54	26.60	10.6340617	9.8333249	15.63	0.8	3.2
01/11/2023	21	44	50.246	-14	52	18.72	10.6431750	9.8330728	15.62	0.8	3.1
01/12/2023	21	45	15.585	-14	50	09.92	10.6520678	9.8328206	15.60	0.8	3.0
01/13/2023	21	45	41.079	-14	48	00.22	10.6607380	9.8325682	15.59	0.8	2.9
01/14/2023	21	46	06.726	-14	45	49.62	10.6691834	9.8323158	15.58	0.8	2.9
01/15/2023	21	46	32.523	-14	43	38.15	10.6774018	9.8320633	15.57	0.8	2.8
01/16/2023	21	46	58.466	-14	41	25.81	10.6853912	9.8318107	15.55	0.8	2.7
01/17/2023	21	47	24.553	-14	39	12.62	10.6931495	9.8315579	15.54	0.8	2.6
01/18/2023	21	47	50.779	-14	36	58.61	10.7006744	9.8313051	15.53	0.8	2.6
01/19/2023	21	48	17.141	-14	34	43.79	10.7079638	9.8310522	15.52	0.8	2.5
01/20/2023	21	48	43.633	-14	32	28.22	10.7150158	9.8307992	15.51	0.8	2.4
01/21/2023	21	49	10.247	-14	30	11.92	10.7218282	9.8305461	15.50	0.8	2.3
01/22/2023	21	49	36.975	-14	27	54.93	10.7283992	9.8302928	15.49	0.8	2.2
01/23/2023	21	50	03.811	-14	25	37.28	10.7347271	9.8300395	15.48	0.8	2.1
01/24/2023	21	50	30.746	-14	23	19.00	10.7408104	9.8297861	15.47	0.8	2.0
01/25/2023	21	50	57.779	-14	21	00.09	10.7466478	9.8295326	15.46	0.8	2.0
01/26/2023	21	51	24.904	-14	18	40.56	10.7522382	9.8292789	15.46	0.8	1.9
01/27/2023	21	51	52.119	-14	16	20.43	10.7575806	9.8290252	15.45	0.8	1.8
01/28/2023	21	52	19.422	-14	13	59.71	10.7626742	9.8287714	15.44	0.8	1.7
01/29/2023	21	52	46.807	-14	11	38.43	10.7675183	9.8285175	15.43	0.8	1.6
01/30/2023	21	53	14.272	-14	09	16.62	10.7721121	9.8282634	15.43	0.8	1.5
01/31/2023	21	53	41.812	-14	06	54.32	10.7764550	9.8280093	15.42	0.8	1.4
02/01/2023	21	54	09.420	-14	04	31.54	10.7805465	9.8277551	15.42	0.8	1.4
02/02/2023	21	54	37.092	-14	02	08.32	10.7843859	9.8275008	15.41	0.8	1.3
02/03/2023	21	55	04.823	-13	59	44.68	10.7879728	9.8272464	15.41	0.8	1.2
02/04/2023	21	55	32.606	-13	57	20.67	10.7913066	9.8269918	15.40	0.8	1.1
02/05/2023	21	56	00.438	-13	54	56.29	10.7943868	9.8267372	15.40	0.8	1.0
02/06/2023	21	56	28.313	-13	52	31.57	10.7972130	9.8264825	15.39	0.8	0.9
02/07/2023	21	56	56.227	-13	50	06.52	10.7997846	9.8262277	15.39	0.8	0.8
02/08/2023	21	57	24.175	-13	47	41.18	10.8021012	9.8259728	15.39	0.8	0.8
02/09/2023	21	57	52.155	-13	45	15.54	10.8041624	9.8257178	15.38	0.8	0.7
02/10/2023	21	58	20.163	-13	42	49.63	10.8059676	9.8254626	15.38	0.8	0.6
02/11/2023	21	58	48.196	-13	40	23.46	10.8075164	9.8252074	15.38	0.8	0.5
02/12/2023	21	59	16.252	-13	37	57.05	10.8088084	9.8249521	15.38	0.8	0.4
02/13/2023	21	59	44.326	-13	35	30.41	10.8098431	9.8246967	15.37	0.8	0.3
02/14/2023	22	00	12.417	-13	33	03.57	10.8106200	9.8244412	15.37	0.8	0.3
02/15/2023	22	00	40.520	-13	30	36.55	10.8111387	9.8241856	15.37	0.8	0.2
02/16/2023	22	01	08.629	-13	28	09.40	10.8113987	9.8239299	15.37	0.8	0.1
02/17/2023	22	01	36.739	-13	25	42.14	10.8113999	9.8236741	15.37	0.8	0.1
02/18/2023	22	02	04.843	-13	23	14.83	10.8111418	9.8234182	15.37	0.8	0.2

Saturn - Apparent data

Date	Right Ascension	Declination	Earth Distance	Solar Distance	Equatorial Diameter	Mag.	Phase Angle
0 h TT	h m s	d m s	au	au	arc sec		deg.
02/19/2023	22 02 32.933	-13 20 47.48	10.8106243	9.8231622	15.37	0.8	0.3
02/20/2023	22 03 01.003	-13 18 20.14	10.8098475	9.8229061	15.37	0.8	0.3
02/21/2023	22 03 29.048	-13 15 52.82	10.8088115	9.8226500	15.38	0.8	0.4
02/22/2023	22 03 57.064	-13 13 25.53	10.8075168	9.8223937	15.38	0.8	0.5
02/23/2023	22 04 25.048	-13 10 58.29	10.8059640	9.8221373	15.38	0.8	0.6
02/24/2023	22 04 52.998	-13 08 31.11	10.8041538	9.8218808	15.38	0.9	0.7
02/25/2023	22 05 20.911	-13 06 04.03	10.8020871	9.8216242	15.39	0.9	0.8
02/26/2023	22 05 48.784	-13 03 37.06	10.7997649	9.8213676	15.39	0.9	0.9
02/27/2023	22 06 16.611	-13 01 10.24	10.7971881	9.8211108	15.39	0.9	1.0
02/28/2023	22 06 44.388	-12 58 43.61	10.7943577	9.8208539	15.40	0.9	1.1
03/01/2023	22 07 12.109	-12 56 17.19	10.7912749	9.8205970	15.40	0.9	1.1
03/02/2023	22 07 39.770	-12 53 51.02	10.7879407	9.8203399	15.41	0.9	1.2
03/03/2023	22 08 07.366	-12 51 25.13	10.7843561	9.8200828	15.41	0.9	1.3
03/04/2023	22 08 34.892	-12 48 59.54	10.7805224	9.8198255	15.42	0.9	1.4
03/05/2023	22 09 02.342	-12 46 34.28	10.7764405	9.8195682	15.42	0.9	1.5
03/06/2023	22 09 29.714	-12 44 09.37	10.7721116	9.8193107	15.43	0.9	1.6
03/07/2023	22 09 57.004	-12 41 44.83	10.7675369	9.8190532	15.43	0.9	1.6
03/08/2023	22 10 24.207	-12 39 20.67	10.7627175	9.8187955	15.44	0.9	1.7
03/09/2023	22 10 51.321	-12 36 56.92	10.7576544	9.8185378	15.45	0.9	1.8
03/10/2023	22 11 18.344	-12 34 33.58	10.7523488	9.8182800	15.46	0.9	1.9
03/11/2023	22 11 45.272	-12 32 10.67	10.7468018	9.8180221	15.46	0.9	2.0
03/12/2023	22 12 12.104	-12 29 48.22	10.7410144	9.8177641	15.47	0.9	2.1
03/13/2023	22 12 38.837	-12 27 26.24	10.7349878	9.8175059	15.48	0.9	2.1
03/14/2023	22 13 05.466	-12 25 04.76	10.7287231	9.8172477	15.49	0.9	2.2
03/15/2023	22 13 31.988	-12 22 43.82	10.7222213	9.8169894	15.50	0.9	2.3
03/16/2023	22 13 58.396	-12 20 23.46	10.7154836	9.8167310	15.51	0.9	2.4
03/17/2023	22 14 24.686	-12 18 03.70	10.7085114	9.8164725	15.52	0.9	2.5
03/18/2023	22 14 50.849	-12 15 44.60	10.7013058	9.8162140	15.53	0.9	2.6
03/19/2023	22 15 16.881	-12 13 26.18	10.6938683	9.8159553	15.54	1.0	2.7
03/20/2023	22 15 42.775	-12 11 08.47	10.6862006	9.8156965	15.55	1.0	2.7
03/21/2023	22 16 08.528	-12 08 51.47	10.6783044	9.8154376	15.56	1.0	2.8
03/22/2023	22 16 34.137	-12 06 35.22	10.6701816	9.8151787	15.58	1.0	2.9
03/23/2023	22 16 59.600	-12 04 19.72	10.6618345	9.8149196	15.59	1.0	3.0
03/24/2023	22 17 24.915	-12 02 05.00	10.6532652	9.8146605	15.60	1.0	3.1
03/25/2023	22 17 50.078	-11 59 51.07	10.6444762	9.8144012	15.61	1.0	3.1
03/26/2023	22 18 15.085	-11 57 37.98	10.6354698	9.8141419	15.63	1.0	3.2
03/27/2023	22 18 39.932	-11 55 25.76	10.6262486	9.8138825	15.64	1.0	3.3
03/28/2023	22 19 04.615	-11 53 14.44	10.6168150	9.8136229	15.65	1.0	3.4
03/29/2023	22 19 29.129	-11 51 04.05	10.6071715	9.8133633	15.67	1.0	3.4
03/30/2023	22 19 53.467	-11 48 54.63	10.5973207	9.8131036	15.68	1.0	3.5
03/31/2023	22 20 17.628	-11 46 46.19	10.5872649	9.8128438	15.70	1.0	3.6
04/01/2023	22 20 41.605	-11 44 38.78	10.5770069	9.8125839	15.71	1.0	3.7
04/02/2023	22 21 05.395	-11 42 32.40	10.5665489	9.8123239	15.73	1.0	3.7
04/03/2023	22 21 28.995	-11 40 27.07	10.5558937	9.8120638	15.74	1.0	3.8
04/04/2023	22 21 52.402	-11 38 22.83	10.5450436	9.8118037	15.76	1.0	3.9
04/05/2023	22 22 15.612	-11 36 19.67	10.5340012	9.8115434	15.78	1.0	3.9
04/06/2023	22 22 38.625	-11 34 17.62	10.5227688	9.8112830	15.79	1.0	4.0
04/07/2023	22 23 01.436	-11 32 16.68	10.5113491	9.8110226	15.81	1.0	4.1
04/08/2023	22 23 24.046	-11 30 16.88	10.4997443	9.8107620	15.83	1.0	4.1
04/09/2023	22 23 46.451	-11 28 18.24	10.4879569	9.8105014	15.85	1.0	4.2

## Saturn - Apparent data

Date 0 h TT	Right Ascension			Declination			Earth	Solar	Equatorial	Mag.	Phase Angle deg.
	h	m	s	d	m	s	Distance au	Distance au	Diameter arc sec		
04/10/2023	22	24	08.648	-11	26	20.77	10.4759892	9.8102407	15.86	1.0	4.2
04/11/2023	22	24	30.634	-11	24	24.52	10.4638437	9.8099799	15.88	1.0	4.3
04/12/2023	22	24	52.403	-11	22	29.52	10.4515228	9.8097190	15.90	1.0	4.4
04/13/2023	22	25	13.950	-11	20	35.80	10.4390289	9.8094580	15.92	1.0	4.4
04/14/2023	22	25	35.269	-11	18	43.40	10.4263647	9.8091969	15.94	1.0	4.5
04/15/2023	22	25	56.354	-11	16	52.35	10.4135328	9.8089357	15.96	1.0	4.6
04/16/2023	22	26	17.200	-11	15	02.68	10.4005360	9.8086744	15.98	1.0	4.6
04/17/2023	22	26	37.804	-11	13	14.40	10.3873772	9.8084131	16.00	1.0	4.7
04/18/2023	22	26	58.163	-11	11	27.53	10.3740596	9.8081516	16.02	1.0	4.7
04/19/2023	22	27	18.275	-11	09	42.08	10.3605864	9.8078901	16.04	1.0	4.8
04/20/2023	22	27	38.138	-11	07	58.07	10.3469611	9.8076284	16.06	1.0	4.9
04/21/2023	22	27	57.749	-11	06	15.53	10.3331870	9.8073667	16.08	1.0	4.9
04/22/2023	22	28	17.105	-11	04	34.46	10.3192679	9.8071049	16.11	1.0	5.0
04/23/2023	22	28	36.204	-11	02	54.92	10.3052073	9.8068430	16.13	1.0	5.0
04/24/2023	22	28	55.040	-11	01	16.93	10.2910090	9.8065810	16.15	1.0	5.1
04/25/2023	22	29	13.610	-10	59	40.51	10.2766766	9.8063189	16.17	1.0	5.1
04/26/2023	22	29	31.908	-10	58	05.71	10.2622137	9.8060567	16.19	1.0	5.2
04/27/2023	22	29	49.931	-10	56	32.53	10.2476241	9.8057944	16.22	1.0	5.2
04/28/2023	22	30	07.675	-10	55	01.02	10.2329115	9.8055321	16.24	1.0	5.3
04/29/2023	22	30	25.137	-10	53	31.18	10.2180794	9.8052696	16.26	1.0	5.3
04/30/2023	22	30	42.313	-10	52	03.03	10.2031315	9.8050071	16.29	1.0	5.3
05/01/2023	22	30	59.202	-10	50	36.58	10.1880714	9.8047445	16.31	1.0	5.4
05/02/2023	22	31	15.800	-10	49	11.85	10.1729027	9.8044817	16.34	1.0	5.4
05/03/2023	22	31	32.107	-10	47	48.85	10.1576290	9.8042189	16.36	1.0	5.4
05/04/2023	22	31	48.121	-10	46	27.59	10.1422537	9.8039560	16.39	1.0	5.5
05/05/2023	22	32	03.840	-10	45	08.07	10.1267805	9.8036930	16.41	1.0	5.5
05/06/2023	22	32	19.264	-10	43	50.31	10.1112128	9.8034300	16.44	1.0	5.5
05/07/2023	22	32	34.390	-10	42	34.33	10.0955540	9.8031668	16.46	1.0	5.6
05/08/2023	22	32	49.215	-10	41	20.14	10.0798074	9.8029035	16.49	1.0	5.6
05/09/2023	22	33	03.736	-10	40	07.79	10.0639765	9.8026402	16.51	1.0	5.6
05/10/2023	22	33	17.948	-10	38	57.30	10.0480648	9.8023768	16.54	1.0	5.7
05/11/2023	22	33	31.844	-10	37	48.71	10.0320757	9.8021132	16.57	1.0	5.7
05/12/2023	22	33	45.422	-10	36	42.03	10.0160129	9.8018496	16.59	1.0	5.7
05/13/2023	22	33	58.675	-10	35	37.29	9.9998801	9.8015859	16.62	1.0	5.8
05/14/2023	22	34	11.602	-10	34	34.51	9.9836811	9.8013221	16.65	1.0	5.8
05/15/2023	22	34	24.200	-10	33	33.69	9.9674200	9.8010582	16.67	1.0	5.8
05/16/2023	22	34	36.467	-10	32	34.83	9.9511008	9.8007943	16.70	1.0	5.8
05/17/2023	22	34	48.404	-10	31	37.96	9.9347279	9.8005302	16.73	1.0	5.9
05/18/2023	22	35	00.007	-10	30	43.08	9.9183056	9.8002660	16.76	1.0	5.9
05/19/2023	22	35	11.277	-10	29	50.20	9.9018384	9.8000018	16.78	1.0	5.9
05/20/2023	22	35	22.210	-10	28	59.35	9.8853307	9.7997375	16.81	1.0	5.9
05/21/2023	22	35	32.803	-10	28	10.55	9.8687870	9.7994731	16.84	1.0	5.9
05/22/2023	22	35	43.053	-10	27	23.82	9.8522120	9.7992086	16.87	1.0	5.9
05/23/2023	22	35	52.956	-10	26	39.18	9.8356101	9.7989440	16.90	1.0	6.0
05/24/2023	22	36	02.511	-10	25	56.66	9.8189858	9.7986793	16.93	1.0	6.0
05/25/2023	22	36	11.713	-10	25	16.26	9.8023437	9.7984145	16.95	1.0	6.0
05/26/2023	22	36	20.561	-10	24	37.99	9.7856881	9.7981496	16.98	1.0	6.0
05/27/2023	22	36	29.054	-10	24	01.87	9.7690235	9.7978847	17.01	1.0	6.0
05/28/2023	22	36	37.189	-10	23	27.89	9.7523544	9.7976196	17.04	1.0	6.0
05/29/2023	22	36	44.965	-10	22	56.06	9.7356849	9.7973545	17.07	1.0	6.0

Saturn - Apparent data

Date 0 h TT	Right Ascension			Declination			Earth	Solar	Equatorial	Mag.	Phase Angle deg.
	h	m	s	d	m	s	Distance au	Distance au	Diameter arc sec		
05/30/2023	22	36	52.383	-10	22	26.38	9.7190196	9.7970893	17.10	1.0	6.0
05/31/2023	22	36	59.442	-10	21	58.85	9.7023625	9.7968240	17.13	1.0	6.0
06/01/2023	22	37	06.143	-10	21	33.45	9.6857181	9.7965586	17.16	1.0	5.9
06/02/2023	22	37	12.486	-10	21	10.20	9.6690903	9.7962931	17.19	1.0	5.9
06/03/2023	22	37	18.470	-10	20	49.10	9.6524834	9.7960275	17.22	1.0	5.9
06/04/2023	22	37	24.095	-10	20	30.14	9.6359013	9.7957619	17.25	0.9	5.9
06/05/2023	22	37	29.360	-10	20	13.35	9.6193481	9.7954961	17.28	0.9	5.9
06/06/2023	22	37	34.261	-10	19	58.75	9.6028278	9.7952303	17.31	0.9	5.9
06/07/2023	22	37	38.794	-10	19	46.36	9.5863444	9.7949644	17.34	0.9	5.9
06/08/2023	22	37	42.956	-10	19	36.19	9.5699020	9.7946984	17.37	0.9	5.9
06/09/2023	22	37	46.745	-10	19	28.24	9.5535049	9.7944323	17.40	0.9	5.9
06/10/2023	22	37	50.159	-10	19	22.53	9.5371574	9.7941661	17.43	0.9	5.9
06/11/2023	22	37	53.197	-10	19	19.04	9.5208639	9.7938998	17.46	0.9	5.8
06/12/2023	22	37	55.861	-10	19	17.77	9.5046290	9.7936334	17.49	0.9	5.8
06/13/2023	22	37	58.150	-10	19	18.70	9.4884574	9.7933670	17.52	0.9	5.8
06/14/2023	22	38	00.067	-10	19	21.84	9.4723540	9.7931004	17.55	0.9	5.8
06/15/2023	22	38	01.612	-10	19	27.19	9.4563234	9.7928338	17.57	0.9	5.8
06/16/2023	22	38	02.784	-10	19	34.74	9.4403705	9.7925671	17.60	0.9	5.7
06/17/2023	22	38	03.582	-10	19	44.50	9.4245003	9.7923003	17.63	0.9	5.7
06/18/2023	22	38	04.008	-10	19	56.48	9.4087175	9.7920334	17.66	0.9	5.7
06/19/2023	22	38	04.058	-10	20	10.67	9.3930271	9.7917664	17.69	0.9	5.6
06/20/2023	22	38	03.733	-10	20	27.09	9.3774337	9.7914994	17.72	0.9	5.6
06/21/2023	22	38	03.033	-10	20	45.72	9.3619422	9.7912322	17.75	0.9	5.6
06/22/2023	22	38	01.957	-10	21	06.55	9.3465572	9.7909650	17.78	0.9	5.5
06/23/2023	22	38	00.506	-10	21	29.59	9.3312833	9.7906976	17.81	0.9	5.5
06/24/2023	22	37	58.682	-10	21	54.80	9.3161252	9.7904302	17.84	0.9	5.4
06/25/2023	22	37	56.487	-10	22	22.19	9.3010872	9.7901627	17.87	0.8	5.4
06/26/2023	22	37	53.921	-10	22	51.71	9.2861739	9.7898951	17.90	0.8	5.3
06/27/2023	22	37	50.989	-10	23	23.36	9.2713896	9.7896274	17.93	0.8	5.3
06/28/2023	22	37	47.694	-10	23	57.10	9.2567386	9.7893597	17.95	0.8	5.2
06/29/2023	22	37	44.038	-10	24	32.92	9.2422250	9.7890918	17.98	0.8	5.2
06/30/2023	22	37	40.024	-10	25	10.80	9.2278530	9.7888239	18.01	0.8	5.1
07/01/2023	22	37	35.656	-10	25	50.71	9.2136265	9.7885558	18.04	0.8	5.1
07/02/2023	22	37	30.935	-10	26	32.65	9.1995496	9.7882877	18.07	0.8	5.0
07/03/2023	22	37	25.862	-10	27	16.61	9.1856260	9.7880195	18.09	0.8	5.0
07/04/2023	22	37	20.438	-10	28	02.59	9.1718596	9.7877512	18.12	0.8	4.9
07/05/2023	22	37	14.660	-10	28	50.58	9.1582542	9.7874829	18.15	0.8	4.9
07/06/2023	22	37	08.531	-10	29	40.58	9.1448137	9.7872144	18.17	0.8	4.8
07/07/2023	22	37	02.050	-10	30	32.56	9.1315421	9.7869459	18.20	0.8	4.7
07/08/2023	22	36	55.220	-10	31	26.49	9.1184436	9.7866772	18.23	0.8	4.7
07/09/2023	22	36	48.046	-10	32	22.34	9.1055222	9.7864085	18.25	0.8	4.6
07/10/2023	22	36	40.533	-10	33	20.09	9.0927823	9.7861397	18.28	0.8	4.6
07/11/2023	22	36	32.684	-10	34	19.69	9.0802282	9.7858708	18.30	0.8	4.5
07/12/2023	22	36	24.505	-10	35	21.13	9.0678642	9.7856018	18.33	0.7	4.4
07/13/2023	22	36	15.998	-10	36	24.37	9.0556946	9.7853328	18.35	0.7	4.4
07/14/2023	22	36	07.168	-10	37	29.41	9.0437237	9.7850636	18.38	0.7	4.3
07/15/2023	22	35	58.017	-10	38	36.21	9.0319557	9.7847944	18.40	0.7	4.2
07/16/2023	22	35	48.548	-10	39	44.76	9.0203949	9.7845251	18.42	0.7	4.1
07/17/2023	22	35	38.765	-10	40	55.02	9.0090452	9.7842557	18.45	0.7	4.1
07/18/2023	22	35	28.671	-10	42	06.98	8.9979108	9.7839862	18.47	0.7	4.0

Saturn - Apparent data

Date 0 h TT	Right Ascension			Declination			Earth	Solar	Equatorial	Mag.	Phase Angle deg.
	h	m	s	d	m	s	Distance au	Distance au	Diameter arc sec		
07/19/2023	22	35	18.271	-10	43	20.61	8.9869954	9.7837166	18.49	0.7	3.9
07/20/2023	22	35	07.568	-10	44	35.85	8.9763029	9.7834469	18.51	0.7	3.8
07/21/2023	22	34	56.568	-10	45	52.68	8.9658370	9.7831772	18.54	0.7	3.7
07/22/2023	22	34	45.277	-10	47	11.05	8.9556012	9.7829074	18.56	0.7	3.6
07/23/2023	22	34	33.701	-10	48	30.91	8.9455989	9.7826374	18.58	0.7	3.6
07/24/2023	22	34	21.847	-10	49	52.22	8.9358336	9.7823674	18.60	0.7	3.5
07/25/2023	22	34	09.721	-10	51	14.93	8.9263083	9.7820974	18.62	0.7	3.4
07/26/2023	22	33	57.331	-10	52	38.99	8.9170262	9.7818272	18.64	0.7	3.3
07/27/2023	22	33	44.685	-10	54	04.35	8.9079902	9.7815569	18.66	0.6	3.2
07/28/2023	22	33	31.789	-10	55	30.97	8.8992032	9.7812866	18.68	0.6	3.1
07/29/2023	22	33	18.649	-10	56	58.81	8.8906677	9.7810161	18.69	0.6	3.0
07/30/2023	22	33	05.272	-10	58	27.84	8.8823865	9.7807456	18.71	0.6	2.9
07/31/2023	22	32	51.662	-10	59	58.02	8.8743618	9.7804750	18.73	0.6	2.8
08/01/2023	22	32	37.823	-11	01	29.33	8.8665962	9.7802043	18.74	0.6	2.7
08/02/2023	22	32	23.759	-11	03	01.73	8.8590920	9.7799336	18.76	0.6	2.7
08/03/2023	22	32	09.473	-11	04	35.19	8.8518515	9.7796627	18.78	0.6	2.6
08/04/2023	22	31	54.974	-11	06	09.66	8.8448773	9.7793918	18.79	0.6	2.5
08/05/2023	22	31	40.267	-11	07	45.09	8.8381718	9.7791207	18.80	0.6	2.4
08/06/2023	22	31	25.362	-11	09	21.40	8.8317377	9.7788496	18.82	0.6	2.3
08/07/2023	22	31	10.269	-11	10	58.55	8.8255775	9.7785784	18.83	0.6	2.2
08/08/2023	22	30	54.995	-11	12	36.49	8.8196938	9.7783071	18.84	0.6	2.1
08/09/2023	22	30	39.548	-11	14	15.17	8.8140890	9.7780358	18.86	0.6	2.0
08/10/2023	22	30	23.936	-11	15	54.56	8.8087658	9.7777643	18.87	0.5	1.9
08/11/2023	22	30	08.166	-11	17	34.60	8.8037263	9.7774928	18.88	0.5	1.8
08/12/2023	22	29	52.245	-11	19	15.27	8.7989728	9.7772211	18.89	0.5	1.7
08/13/2023	22	29	36.179	-11	20	56.50	8.7945074	9.7769494	18.90	0.5	1.6
08/14/2023	22	29	19.976	-11	22	38.26	8.7903320	9.7766777	18.91	0.5	1.5
08/15/2023	22	29	03.644	-11	24	20.50	8.7864483	9.7764058	18.91	0.5	1.4
08/16/2023	22	28	47.191	-11	26	03.15	8.7828582	9.7761338	18.92	0.5	1.3
08/17/2023	22	28	30.626	-11	27	46.17	8.7795630	9.7758618	18.93	0.5	1.2
08/18/2023	22	28	13.957	-11	29	29.49	8.7765640	9.7755896	18.94	0.5	1.0
08/19/2023	22	27	57.194	-11	31	13.05	8.7738625	9.7753174	18.94	0.5	0.9
08/20/2023	22	27	40.348	-11	32	56.79	8.7714595	9.7750451	18.95	0.5	0.8
08/21/2023	22	27	23.428	-11	34	40.65	8.7693558	9.7747728	18.95	0.5	0.7
08/22/2023	22	27	06.445	-11	36	24.56	8.7675521	9.7745003	18.96	0.5	0.6
08/23/2023	22	26	49.409	-11	38	08.46	8.7660489	9.7742278	18.96	0.5	0.5
08/24/2023	22	26	32.329	-11	39	52.31	8.7648466	9.7739551	18.96	0.5	0.4
08/25/2023	22	26	15.216	-11	41	36.03	8.7639454	9.7736824	18.96	0.5	0.3
08/26/2023	22	25	58.079	-11	43	19.59	8.7633453	9.7734096	18.96	0.4	0.2
08/27/2023	22	25	40.924	-11	45	02.95	8.7630462	9.7731367	18.97	0.4	0.2
08/28/2023	22	25	23.760	-11	46	46.07	8.7630480	9.7728638	18.97	0.4	0.2
08/29/2023	22	25	06.591	-11	48	28.91	8.7633504	9.7725907	18.96	0.4	0.2
08/30/2023	22	24	49.425	-11	50	11.42	8.7639531	9.7723176	18.96	0.4	0.3
08/31/2023	22	24	32.270	-11	51	53.55	8.7648557	9.7720444	18.96	0.4	0.4
09/01/2023	22	24	15.134	-11	53	35.25	8.7660580	9.7717711	18.96	0.4	0.5
09/02/2023	22	23	58.027	-11	55	16.45	8.7675598	9.7714977	18.96	0.4	0.6
09/03/2023	22	23	40.961	-11	56	57.09	8.7693609	9.7712242	18.95	0.4	0.7
09/04/2023	22	23	23.945	-11	58	37.11	8.7714611	9.7709507	18.95	0.4	0.8
09/05/2023	22	23	06.991	-12	00	16.47	8.7738600	9.7706770	18.94	0.4	0.9
09/06/2023	22	22	50.106	-12	01	55.12	8.7765575	9.7704033	18.94	0.4	1.0

Saturn - Apparent data

Date 0 h TT	Right Ascension			Declination			Earth	Solar	Equatorial	Mag.	Phase Angle deg.
	h	m	s	d	m	s	Distance au	Distance au	Diameter arc sec		
09/07/2023	22	22	33.299	-12	03	33.03	8.7795529	9.7701295	18.93	0.4	1.1
09/08/2023	22	22	16.578	-12	05	10.16	8.7828456	9.7698557	18.92	0.4	1.2
09/09/2023	22	21	59.951	-12	06	46.45	8.7864349	9.7695817	18.91	0.4	1.3
09/10/2023	22	21	43.425	-12	08	21.87	8.7903198	9.7693077	18.91	0.4	1.4
09/11/2023	22	21	27.009	-12	09	56.38	8.7944992	9.7690335	18.90	0.4	1.5
09/12/2023	22	21	10.712	-12	11	29.91	8.7989720	9.7687593	18.89	0.4	1.6
09/13/2023	22	20	54.542	-12	13	02.43	8.8037366	9.7684850	18.88	0.4	1.7
09/14/2023	22	20	38.508	-12	14	33.87	8.8087915	9.7682107	18.87	0.4	1.8
09/15/2023	22	20	22.620	-12	16	04.19	8.8141350	9.7679362	18.86	0.4	1.9
09/16/2023	22	20	06.888	-12	17	33.33	8.8197652	9.7676617	18.84	0.4	2.0
09/17/2023	22	19	51.321	-12	19	01.23	8.8256801	9.7673871	18.83	0.4	2.2
09/18/2023	22	19	35.930	-12	20	27.85	8.8318773	9.7671124	18.82	0.4	2.3
09/19/2023	22	19	20.723	-12	21	53.13	8.8383546	9.7668376	18.80	0.5	2.4
09/20/2023	22	19	05.711	-12	23	17.03	8.8451095	9.7665628	18.79	0.5	2.4
09/21/2023	22	18	50.901	-12	24	39.52	8.8521392	9.7662878	18.77	0.5	2.5
09/22/2023	22	18	36.302	-12	26	00.55	8.8594409	9.7660128	18.76	0.5	2.6
09/23/2023	22	18	21.920	-12	27	20.09	8.8670119	9.7657377	18.74	0.5	2.7
09/24/2023	22	18	07.761	-12	28	38.13	8.8748489	9.7654625	18.73	0.5	2.8
09/25/2023	22	17	53.831	-12	29	54.64	8.8829491	9.7651873	18.71	0.5	2.9
09/26/2023	22	17	40.134	-12	31	09.59	8.8913092	9.7649119	18.69	0.5	3.0
09/27/2023	22	17	26.675	-12	32	22.94	8.8999262	9.7646365	18.67	0.5	3.1
09/28/2023	22	17	13.462	-12	33	34.67	8.9087970	9.7643610	18.66	0.5	3.2
09/29/2023	22	17	00.500	-12	34	44.73	8.9179186	9.7640854	18.64	0.5	3.3
09/30/2023	22	16	47.800	-12	35	53.07	8.9272879	9.7638098	18.62	0.5	3.3
10/01/2023	22	16	35.369	-12	36	59.66	8.9369021	9.7635340	18.60	0.5	3.4
10/02/2023	22	16	23.215	-12	38	04.46	8.9467583	9.7632582	18.58	0.5	3.5
10/03/2023	22	16	11.345	-12	39	07.45	8.9568534	9.7629823	18.56	0.5	3.6
10/04/2023	22	15	59.765	-12	40	08.62	8.9671845	9.7627063	18.53	0.5	3.7
10/05/2023	22	15	48.479	-12	41	07.94	8.9777483	9.7624303	18.51	0.5	3.7
10/06/2023	22	15	37.492	-12	42	05.41	8.9885417	9.7621542	18.49	0.5	3.8
10/07/2023	22	15	26.808	-12	43	00.98	8.9995611	9.7618779	18.47	0.5	3.9
10/08/2023	22	15	16.434	-12	43	54.66	9.0108030	9.7616017	18.44	0.5	4.0
10/09/2023	22	15	06.373	-12	44	46.40	9.0222639	9.7613253	18.42	0.5	4.1
10/10/2023	22	14	56.632	-12	45	36.18	9.0339399	9.7610489	18.40	0.6	4.1
10/11/2023	22	14	47.215	-12	46	23.97	9.0458271	9.7607723	18.37	0.6	4.2
10/12/2023	22	14	38.128	-12	47	09.75	9.0579215	9.7604957	18.35	0.6	4.3
10/13/2023	22	14	29.378	-12	47	53.48	9.0702190	9.7602191	18.32	0.6	4.4
10/14/2023	22	14	20.970	-12	48	35.13	9.0827153	9.7599423	18.30	0.6	4.4
10/15/2023	22	14	12.910	-12	49	14.68	9.0954060	9.7596655	18.27	0.6	4.5
10/16/2023	22	14	05.204	-12	49	52.10	9.1082867	9.7593886	18.25	0.6	4.6
10/17/2023	22	13	57.858	-12	50	27.37	9.1213528	9.7591116	18.22	0.6	4.6
10/18/2023	22	13	50.875	-12	51	00.48	9.1345996	9.7588345	18.19	0.6	4.7
10/19/2023	22	13	44.260	-12	51	31.42	9.1480223	9.7585574	18.17	0.6	4.8
10/20/2023	22	13	38.015	-12	52	00.18	9.1616162	9.7582801	18.14	0.6	4.8
10/21/2023	22	13	32.142	-12	52	26.76	9.1753763	9.7580028	18.11	0.6	4.9
10/22/2023	22	13	26.641	-12	52	51.17	9.1892977	9.7577255	18.09	0.6	4.9
10/23/2023	22	13	21.514	-12	53	13.40	9.2033756	9.7574480	18.06	0.6	5.0
10/24/2023	22	13	16.762	-12	53	33.44	9.2176052	9.7571705	18.03	0.6	5.0
10/25/2023	22	13	12.386	-12	53	51.29	9.2319817	9.7568929	18.00	0.6	5.1
10/26/2023	22	13	08.388	-12	54	06.93	9.2465004	9.7566152	17.97	0.6	5.1

Saturn - Apparent data

Date 0 h TT	Right Ascension			Declination			Earth	Solar	Equatorial	Mag.	Phase Angle deg.
	h	m	s	d	m	s	Distance au	Distance au	Diameter arc sec		
10/27/2023	22	13	04.773	-12	54	20.34	9.2611568	9.7563375	17.95	0.6	5.2
10/28/2023	22	13	01.543	-12	54	31.51	9.2759462	9.7560596	17.92	0.6	5.2
10/29/2023	22	12	58.704	-12	54	40.42	9.2908644	9.7557817	17.89	0.6	5.2
10/30/2023	22	12	56.256	-12	54	47.07	9.3059069	9.7555037	17.86	0.7	5.3
10/31/2023	22	12	54.203	-12	54	51.48	9.3210693	9.7552257	17.83	0.7	5.3
11/01/2023	22	12	52.543	-12	54	53.64	9.3363471	9.7549476	17.80	0.7	5.4
11/02/2023	22	12	51.278	-12	54	53.57	9.3517360	9.7546693	17.77	0.7	5.4
11/03/2023	22	12	50.406	-12	54	51.26	9.3672313	9.7543911	17.74	0.7	5.4
11/04/2023	22	12	49.929	-12	54	46.73	9.3828283	9.7541127	17.71	0.7	5.5
11/05/2023	22	12	49.847	-12	54	39.97	9.3985224	9.7538343	17.68	0.7	5.5
11/06/2023	22	12	50.159	-12	54	30.98	9.4143088	9.7535558	17.65	0.7	5.5
11/07/2023	22	12	50.868	-12	54	19.74	9.4301826	9.7532772	17.62	0.7	5.6
11/08/2023	22	12	51.973	-12	54	06.27	9.4461389	9.7529985	17.59	0.7	5.6
11/09/2023	22	12	53.477	-12	53	50.54	9.4621727	9.7527198	17.56	0.7	5.6
11/10/2023	22	12	55.381	-12	53	32.55	9.4782789	9.7524410	17.53	0.7	5.6
11/11/2023	22	12	57.687	-12	53	12.29	9.4944525	9.7521621	17.50	0.7	5.7
11/12/2023	22	13	00.394	-12	52	49.77	9.5106882	9.7518831	17.47	0.7	5.7
11/13/2023	22	13	03.506	-12	52	24.98	9.5269809	9.7516041	17.44	0.7	5.7
11/14/2023	22	13	07.022	-12	51	57.92	9.5433252	9.7513250	17.41	0.7	5.7
11/15/2023	22	13	10.941	-12	51	28.60	9.5597158	9.7510458	17.38	0.7	5.7
11/16/2023	22	13	15.263	-12	50	57.05	9.5761474	9.7507666	17.36	0.7	5.8
11/17/2023	22	13	19.984	-12	50	23.28	9.5926147	9.7504872	17.33	0.7	5.8
11/18/2023	22	13	25.102	-12	49	47.30	9.6091124	9.7502078	17.30	0.7	5.8
11/19/2023	22	13	30.612	-12	49	09.15	9.6256352	9.7499283	17.27	0.7	5.8
11/20/2023	22	13	36.513	-12	48	28.82	9.6421779	9.7496488	17.24	0.8	5.8
11/21/2023	22	13	42.802	-12	47	46.34	9.6587357	9.7493692	17.21	0.8	5.8
11/22/2023	22	13	49.476	-12	47	01.70	9.6753034	9.7490895	17.18	0.8	5.8
11/23/2023	22	13	56.535	-12	46	14.90	9.6918765	9.7488097	17.15	0.8	5.8
11/24/2023	22	14	03.980	-12	45	25.95	9.7084501	9.7485299	17.12	0.8	5.8
11/25/2023	22	14	11.809	-12	44	34.85	9.7250197	9.7482500	17.09	0.8	5.8
11/26/2023	22	14	20.023	-12	43	41.61	9.7415809	9.7479700	17.06	0.8	5.8
11/27/2023	22	14	28.618	-12	42	46.25	9.7581293	9.7476899	17.03	0.8	5.8
11/28/2023	22	14	37.593	-12	41	48.80	9.7746605	9.7474098	17.00	0.8	5.7
11/29/2023	22	14	46.944	-12	40	49.27	9.7911702	9.7471296	16.97	0.8	5.7
11/30/2023	22	14	56.667	-12	39	47.70	9.8076539	9.7468493	16.95	0.8	5.7
12/01/2023	22	15	06.758	-12	38	44.09	9.8241072	9.7465689	16.92	0.8	5.7
12/02/2023	22	15	17.215	-12	37	38.47	9.8405257	9.7462885	16.89	0.8	5.7
12/03/2023	22	15	28.035	-12	36	30.84	9.8569049	9.7460080	16.86	0.8	5.7
12/04/2023	22	15	39.215	-12	35	21.21	9.8732403	9.7457275	16.83	0.8	5.7
12/05/2023	22	15	50.752	-12	34	09.60	9.8895273	9.7454468	16.81	0.8	5.7
12/06/2023	22	16	02.646	-12	32	56.00	9.9057614	9.7451661	16.78	0.8	5.6
12/07/2023	22	16	14.894	-12	31	40.43	9.9219380	9.7448853	16.75	0.8	5.6
12/08/2023	22	16	27.494	-12	30	22.90	9.9380524	9.7446045	16.72	0.8	5.6
12/09/2023	22	16	40.446	-12	29	03.40	9.9541001	9.7443236	16.70	0.8	5.6
12/10/2023	22	16	53.747	-12	27	41.95	9.9700763	9.7440426	16.67	0.8	5.6
12/11/2023	22	17	07.395	-12	26	18.56	9.9859765	9.7437615	16.64	0.8	5.5
12/12/2023	22	17	21.388	-12	24	53.26	10.0017959	9.7434804	16.62	0.8	5.5
12/13/2023	22	17	35.722	-12	23	26.06	10.0175298	9.7431991	16.59	0.8	5.5
12/14/2023	22	17	50.392	-12	21	57.00	10.0331737	9.7429179	16.56	0.8	5.4
12/15/2023	22	18	05.393	-12	20	26.11	10.0487228	9.7426365	16.54	0.8	5.4

Saturn - Apparent data

Date	Right Ascension	Declination	Earth Distance	Solar Distance	Equatorial Diameter	Mag.	Phase Angle
0 h TT	h m s	d m s	au	au	arc sec		deg.
12/16/2023	22 18 20.718	-12 18 53.41	10.0641727	9.7423551	16.51	0.9	5.4
12/17/2023	22 18 36.362	-12 17 18.95	10.0795190	9.7420736	16.49	0.9	5.3
12/18/2023	22 18 52.319	-12 15 42.72	10.0947573	9.7417920	16.46	0.9	5.3
12/19/2023	22 19 08.587	-12 14 04.76	10.1098837	9.7415104	16.44	0.9	5.2
12/20/2023	22 19 25.161	-12 12 25.06	10.1248941	9.7412287	16.41	0.9	5.2
12/21/2023	22 19 42.040	-12 10 43.64	10.1397849	9.7409469	16.39	0.9	5.1
12/22/2023	22 19 59.222	-12 09 00.51	10.1545523	9.7406651	16.37	0.9	5.1
12/23/2023	22 20 16.702	-12 07 15.69	10.1691927	9.7403832	16.34	0.9	5.1
12/24/2023	22 20 34.479	-12 05 29.21	10.1837029	9.7401012	16.32	0.9	5.0
12/25/2023	22 20 52.548	-12 03 41.09	10.1980793	9.7398191	16.30	0.9	5.0
12/26/2023	22 21 10.904	-12 01 51.37	10.2123186	9.7395370	16.27	0.9	4.9
12/27/2023	22 21 29.541	-12 00 00.07	10.2264176	9.7392548	16.25	0.9	4.9
12/28/2023	22 21 48.454	-11 58 07.22	10.2403729	9.7389726	16.23	0.9	4.8
12/29/2023	22 22 07.639	-11 56 12.85	10.2541812	9.7386902	16.21	0.9	4.8
12/30/2023	22 22 27.090	-11 54 16.98	10.2678392	9.7384078	16.19	0.9	4.7
12/31/2023	22 22 46.803	-11 52 19.62	10.2813436	9.7381254	16.16	0.9	4.7
01/01/2024	22 23 06.775	-11 50 20.80	10.2946910	9.7378428	16.14	0.9	4.6
01/02/2024	22 23 27.002	-11 48 20.52	10.3078781	9.7375602	16.12	0.9	4.6



Uranus - Apparent data

Date	Right Ascension	Declination	Earth Distance	Solar Distance	Equatorial Diameter	Mag.	Phase Angle
0 h TT	h m s	d m s	au	au	arc sec		deg.
12/31/2022	02 51 14.565	16 02 32.29	19.0774063	19.6700562	3.69	5.7	2.3
01/01/2023	02 51 10.023	16 02 13.80	19.0913745	19.6699065	3.69	5.7	2.4
01/02/2023	02 51 05.669	16 01 56.15	19.1055173	19.6697569	3.69	5.7	2.4
01/03/2023	02 51 01.507	16 01 39.35	19.1198299	19.6696072	3.69	5.7	2.4
01/04/2023	02 50 57.537	16 01 23.40	19.1343075	19.6694574	3.68	5.7	2.5
01/05/2023	02 50 53.760	16 01 08.31	19.1489456	19.6693077	3.68	5.7	2.5
01/06/2023	02 50 50.175	16 00 54.09	19.1637393	19.6691579	3.68	5.7	2.5
01/07/2023	02 50 46.785	16 00 40.74	19.1786841	19.6690081	3.67	5.7	2.5
01/08/2023	02 50 43.588	16 00 28.26	19.1937752	19.6688582	3.67	5.7	2.6
01/09/2023	02 50 40.585	16 00 16.65	19.2090079	19.6687084	3.67	5.7	2.6
01/10/2023	02 50 37.779	16 00 05.91	19.2243775	19.6685585	3.67	5.7	2.6
01/11/2023	02 50 35.168	15 59 56.03	19.2398792	19.6684085	3.66	5.7	2.6
01/12/2023	02 50 32.757	15 59 47.03	19.2555083	19.6682586	3.66	5.7	2.6
01/13/2023	02 50 30.545	15 59 38.91	19.2712599	19.6681086	3.66	5.7	2.7
01/14/2023	02 50 28.537	15 59 31.67	19.2871291	19.6679586	3.65	5.7	2.7
01/15/2023	02 50 26.734	15 59 25.32	19.3031110	19.6678086	3.65	5.7	2.7
01/16/2023	02 50 25.138	15 59 19.88	19.3192006	19.6676585	3.65	5.7	2.7
01/17/2023	02 50 23.753	15 59 15.36	19.3353928	19.6675084	3.65	5.7	2.7
01/18/2023	02 50 22.578	15 59 11.78	19.3516824	19.6673583	3.64	5.7	2.8
01/19/2023	02 50 21.616	15 59 09.15	19.3680642	19.6672081	3.64	5.7	2.8
01/20/2023	02 50 20.866	15 59 07.48	19.3845327	19.6670579	3.64	5.7	2.8
01/21/2023	02 50 20.325	15 59 06.76	19.4010824	19.6669077	3.63	5.7	2.8
01/22/2023	02 50 19.992	15 59 06.98	19.4177075	19.6667575	3.63	5.7	2.8
01/23/2023	02 50 19.864	15 59 08.13	19.4344022	19.6666072	3.63	5.7	2.8
01/24/2023	02 50 19.942	15 59 10.20	19.4511609	19.6664569	3.62	5.7	2.8
01/25/2023	02 50 20.228	15 59 13.16	19.4679776	19.6663066	3.62	5.7	2.8
01/26/2023	02 50 20.723	15 59 17.04	19.4848466	19.6661563	3.62	5.7	2.9
01/27/2023	02 50 21.430	15 59 21.82	19.5017624	19.6660059	3.61	5.7	2.9
01/28/2023	02 50 22.349	15 59 27.54	19.5187194	19.6658555	3.61	5.7	2.9
01/29/2023	02 50 23.483	15 59 34.18	19.5357122	19.6657050	3.61	5.7	2.9
01/30/2023	02 50 24.829	15 59 41.77	19.5527355	19.6655546	3.60	5.7	2.9
01/31/2023	02 50 26.387	15 59 50.29	19.5697841	19.6654041	3.60	5.7	2.9
02/01/2023	02 50 28.157	15 59 59.75	19.5868528	19.6652536	3.60	5.7	2.9
02/02/2023	02 50 30.135	16 00 10.15	19.6039366	19.6651030	3.60	5.7	2.9
02/03/2023	02 50 32.321	16 00 21.47	19.6210303	19.6649524	3.59	5.7	2.9
02/04/2023	02 50 34.714	16 00 33.70	19.6381289	19.6648018	3.59	5.7	2.9
02/05/2023	02 50 37.311	16 00 46.85	19.6552276	19.6646512	3.59	5.8	2.9
02/06/2023	02 50 40.111	16 01 00.88	19.6723215	19.6645005	3.58	5.8	2.9
02/07/2023	02 50 43.115	16 01 15.81	19.6894055	19.6643499	3.58	5.8	2.9
02/08/2023	02 50 46.321	16 01 31.61	19.7064749	19.6641991	3.58	5.8	2.9
02/09/2023	02 50 49.729	16 01 48.29	19.7235247	19.6640484	3.57	5.8	2.9
02/10/2023	02 50 53.341	16 02 05.83	19.7405502	19.6638976	3.57	5.8	2.9
02/11/2023	02 50 57.156	16 02 24.25	19.7575466	19.6637468	3.57	5.8	2.9
02/12/2023	02 51 01.175	16 02 43.54	19.7745088	19.6635960	3.56	5.8	2.9
02/13/2023	02 51 05.398	16 03 03.71	19.7914321	19.6634451	3.56	5.8	2.9
02/14/2023	02 51 09.826	16 03 24.77	19.8083114	19.6632942	3.56	5.8	2.9
02/15/2023	02 51 14.457	16 03 46.71	19.8251419	19.6631433	3.56	5.8	2.8
02/16/2023	02 51 19.290	16 04 09.54	19.8419184	19.6629924	3.55	5.8	2.8
02/17/2023	02 51 24.321	16 04 33.25	19.8586359	19.6628414	3.55	5.8	2.8
02/18/2023	02 51 29.547	16 04 57.82	19.8752891	19.6626904	3.55	5.8	2.8

Uranus - Apparent data

Date	Right Ascension	Declination	Earth Distance	Solar Distance	Equatorial Diameter	Mag.	Phase Angle
0 h TT	h m s	d m s	au	au	arc sec		deg.
02/19/2023	02 51 34.965	16 05 23.24	19.8918729	19.6625394	3.54	5.8	2.8
02/20/2023	02 51 40.572	16 05 49.48	19.9083819	19.6623883	3.54	5.8	2.8
02/21/2023	02 51 46.367	16 06 16.52	19.9248108	19.6622372	3.54	5.8	2.8
02/22/2023	02 51 52.350	16 06 44.35	19.9411546	19.6620861	3.53	5.8	2.8
02/23/2023	02 51 58.522	16 07 12.96	19.9574081	19.6619350	3.53	5.8	2.8
02/24/2023	02 52 04.884	16 07 42.36	19.9735665	19.6617838	3.53	5.8	2.7
02/25/2023	02 52 11.434	16 08 12.55	19.9896250	19.6616326	3.53	5.8	2.7
02/26/2023	02 52 18.172	16 08 43.53	20.0055791	19.6614814	3.52	5.8	2.7
02/27/2023	02 52 25.095	16 09 15.30	20.0214243	19.6613301	3.52	5.8	2.7
02/28/2023	02 52 32.199	16 09 47.84	20.0371564	19.6611788	3.52	5.8	2.7
03/01/2023	02 52 39.483	16 10 21.15	20.0527710	19.6610275	3.51	5.8	2.6
03/02/2023	02 52 46.943	16 10 55.21	20.0682641	19.6608762	3.51	5.8	2.6
03/03/2023	02 52 54.575	16 11 30.01	20.0836316	19.6607248	3.51	5.8	2.6
03/04/2023	02 53 02.378	16 12 05.53	20.0988696	19.6605734	3.51	5.8	2.6
03/05/2023	02 53 10.349	16 12 41.75	20.1139742	19.6604219	3.50	5.8	2.6
03/06/2023	02 53 18.485	16 13 18.66	20.1289415	19.6602705	3.50	5.8	2.5
03/07/2023	02 53 26.785	16 13 56.24	20.1437677	19.6601190	3.50	5.8	2.5
03/08/2023	02 53 35.248	16 14 34.49	20.1584493	19.6599675	3.50	5.8	2.5
03/09/2023	02 53 43.872	16 15 13.38	20.1729824	19.6598159	3.49	5.8	2.5
03/10/2023	02 53 52.658	16 15 52.92	20.1873634	19.6596644	3.49	5.8	2.4
03/11/2023	02 54 01.605	16 16 33.10	20.2015887	19.6595128	3.49	5.8	2.4
03/12/2023	02 54 10.711	16 17 13.92	20.2156547	19.6593611	3.49	5.8	2.4
03/13/2023	02 54 19.975	16 17 55.39	20.2295578	19.6592095	3.48	5.8	2.4
03/14/2023	02 54 29.397	16 18 37.49	20.2432942	19.6590578	3.48	5.8	2.3
03/15/2023	02 54 38.972	16 19 20.23	20.2568603	19.6589061	3.48	5.8	2.3
03/16/2023	02 54 48.698	16 20 03.60	20.2702523	19.6587544	3.48	5.8	2.3
03/17/2023	02 54 58.571	16 20 47.57	20.2834666	19.6586026	3.47	5.8	2.2
03/18/2023	02 55 08.585	16 21 32.13	20.2964992	19.6584508	3.47	5.8	2.2
03/19/2023	02 55 18.738	16 22 17.25	20.3093465	19.6582990	3.47	5.8	2.2
03/20/2023	02 55 29.026	16 23 02.91	20.3220047	19.6581471	3.47	5.8	2.2
03/21/2023	02 55 39.449	16 23 49.08	20.3344700	19.6579952	3.47	5.8	2.1
03/22/2023	02 55 50.005	16 24 35.75	20.3467390	19.6578433	3.46	5.8	2.1
03/23/2023	02 56 00.696	16 25 22.92	20.3588080	19.6576914	3.46	5.8	2.1
03/24/2023	02 56 11.519	16 26 10.59	20.3706739	19.6575394	3.46	5.8	2.0
03/25/2023	02 56 22.474	16 26 58.75	20.3823336	19.6573874	3.46	5.8	2.0
03/26/2023	02 56 33.557	16 27 47.41	20.3937842	19.6572354	3.46	5.8	1.9
03/27/2023	02 56 44.764	16 28 36.56	20.4050228	19.6570833	3.45	5.8	1.9
03/28/2023	02 56 56.093	16 29 26.17	20.4160469	19.6569312	3.45	5.8	1.9
03/29/2023	02 57 07.538	16 30 16.24	20.4268540	19.6567791	3.45	5.8	1.8
03/30/2023	02 57 19.097	16 31 06.74	20.4374416	19.6566270	3.45	5.8	1.8
03/31/2023	02 57 30.765	16 31 57.66	20.4478074	19.6564748	3.45	5.8	1.8
04/01/2023	02 57 42.539	16 32 48.97	20.4579492	19.6563226	3.45	5.8	1.7
04/02/2023	02 57 54.418	16 33 40.66	20.4678648	19.6561704	3.44	5.8	1.7
04/03/2023	02 58 06.397	16 34 32.71	20.4775520	19.6560181	3.44	5.8	1.6
04/04/2023	02 58 18.476	16 35 25.11	20.4870090	19.6558659	3.44	5.8	1.6
04/05/2023	02 58 30.652	16 36 17.84	20.4962337	19.6557135	3.44	5.8	1.6
04/06/2023	02 58 42.924	16 37 10.89	20.5052243	19.6555612	3.44	5.8	1.5
04/07/2023	02 58 55.293	16 38 04.27	20.5139788	19.6554088	3.44	5.8	1.5
04/08/2023	02 59 07.755	16 38 57.95	20.5224953	19.6552564	3.43	5.8	1.4
04/09/2023	02 59 20.310	16 39 51.96	20.5307720	19.6551040	3.43	5.8	1.4

Uranus - Apparent data

Date	Right Ascension	Declination	Earth Distance	Solar Distance	Equatorial Diameter	Mag.	Phase Angle
0 h TT	h m s	d m s	au	au	arc sec		deg.
04/10/2023	02 59 32.956	16 40 46.28	20.5388070	19.6549516	3.43	5.8	1.4
04/11/2023	02 59 45.689	16 41 40.90	20.5465985	19.6547991	3.43	5.8	1.3
04/12/2023	02 59 58.506	16 42 35.82	20.5541443	19.6546466	3.43	5.8	1.3
04/13/2023	03 00 11.402	16 43 31.03	20.5614427	19.6544941	3.43	5.8	1.2
04/14/2023	03 00 24.372	16 44 26.49	20.5684916	19.6543415	3.43	5.8	1.2
04/15/2023	03 00 37.413	16 45 22.19	20.5752890	19.6541889	3.43	5.8	1.2
04/16/2023	03 00 50.521	16 46 18.09	20.5818330	19.6540363	3.42	5.8	1.1
04/17/2023	03 01 03.694	16 47 14.19	20.5881217	19.6538837	3.42	5.8	1.1
04/18/2023	03 01 16.932	16 48 10.45	20.5941533	19.6537310	3.42	5.8	1.0
04/19/2023	03 01 30.232	16 49 06.88	20.5999261	19.6535783	3.42	5.8	1.0
04/20/2023	03 01 43.595	16 50 03.47	20.6054386	19.6534256	3.42	5.8	0.9
04/21/2023	03 01 57.019	16 51 00.23	20.6106894	19.6532729	3.42	5.8	0.9
04/22/2023	03 02 10.502	16 51 57.14	20.6156775	19.6531201	3.42	5.8	0.8
04/23/2023	03 02 24.039	16 52 54.20	20.6204016	19.6529673	3.42	5.8	0.8
04/24/2023	03 02 37.626	16 53 51.40	20.6248611	19.6528145	3.42	5.8	0.7
04/25/2023	03 02 51.260	16 54 48.73	20.6290551	19.6526616	3.42	5.8	0.7
04/26/2023	03 03 04.936	16 55 46.16	20.6329831	19.6525087	3.42	5.9	0.7
04/27/2023	03 03 18.650	16 56 43.68	20.6366444	19.6523558	3.42	5.9	0.6
04/28/2023	03 03 32.399	16 57 41.26	20.6400387	19.6522029	3.41	5.9	0.6
04/29/2023	03 03 46.179	16 58 38.90	20.6431656	19.6520500	3.41	5.9	0.5
04/30/2023	03 03 59.988	16 59 36.57	20.6460248	19.6518970	3.41	5.9	0.5
05/01/2023	03 04 13.824	17 00 34.25	20.6486160	19.6517440	3.41	5.9	0.4
05/02/2023	03 04 27.685	17 01 31.94	20.6509392	19.6515909	3.41	5.9	0.4
05/03/2023	03 04 41.569	17 02 29.63	20.6529942	19.6514379	3.41	5.9	0.3
05/04/2023	03 04 55.475	17 03 27.30	20.6547808	19.6512848	3.41	5.9	0.3
05/05/2023	03 05 09.402	17 04 24.96	20.6562992	19.6511317	3.41	5.9	0.2
05/06/2023	03 05 23.348	17 05 22.60	20.6575492	19.6509785	3.41	5.9	0.2
05/07/2023	03 05 37.313	17 06 20.23	20.6585307	19.6508254	3.41	5.9	0.2
05/08/2023	03 05 51.291	17 07 17.84	20.6592438	19.6506722	3.41	5.9	0.1
05/09/2023	03 06 05.281	17 08 15.43	20.6596882	19.6505189	3.41	5.9	0.1
05/10/2023	03 06 19.277	17 09 12.98	20.6598637	19.6503657	3.41	5.9	0.0
05/11/2023	03 06 33.274	17 10 10.48	20.6597702	19.6502124	3.41	5.9	0.0
05/12/2023	03 06 47.269	17 11 07.89	20.6594075	19.6500591	3.41	5.9	0.1
05/13/2023	03 07 01.257	17 12 05.19	20.6587754	19.6499058	3.41	5.9	0.1
05/14/2023	03 07 15.236	17 13 02.37	20.6578737	19.6497525	3.41	5.9	0.2
05/15/2023	03 07 29.206	17 13 59.41	20.6567024	19.6495991	3.41	5.9	0.2
05/16/2023	03 07 43.165	17 14 56.30	20.6552616	19.6494457	3.41	5.9	0.3
05/17/2023	03 07 57.113	17 15 53.04	20.6535515	19.6492923	3.41	5.9	0.3
05/18/2023	03 08 11.047	17 16 49.62	20.6515724	19.6491388	3.41	5.9	0.4
05/19/2023	03 08 24.967	17 17 46.05	20.6493249	19.6489853	3.41	5.9	0.4
05/20/2023	03 08 38.868	17 18 42.32	20.6468095	19.6488318	3.41	5.9	0.5
05/21/2023	03 08 52.746	17 19 38.42	20.6440272	19.6486783	3.41	5.9	0.5
05/22/2023	03 09 06.599	17 20 34.35	20.6409788	19.6485247	3.41	5.9	0.6
05/23/2023	03 09 20.420	17 21 30.09	20.6376654	19.6483712	3.42	5.9	0.6
05/24/2023	03 09 34.207	17 22 25.61	20.6340881	19.6482176	3.42	5.8	0.6
05/25/2023	03 09 47.956	17 23 20.91	20.6302482	19.6480639	3.42	5.8	0.7
05/26/2023	03 10 01.662	17 24 15.96	20.6261471	19.6479103	3.42	5.8	0.7
05/27/2023	03 10 15.325	17 25 10.76	20.6217861	19.6477566	3.42	5.8	0.8
05/28/2023	03 10 28.941	17 26 05.28	20.6171666	19.6476029	3.42	5.8	0.8
05/29/2023	03 10 42.508	17 26 59.51	20.6122902	19.6474492	3.42	5.8	0.9

Uranus - Apparent data

Date	Right Ascension	Declination	Earth Distance	Solar Distance	Equatorial Diameter	Mag.	Phase Angle
0 h TT	h m s	d m s	au	au	arc sec		deg.
05/30/2023	03 10 56.025	17 27 53.44	20.6071585	19.6472954	3.42	5.8	0.9
05/31/2023	03 11 09.491	17 28 47.08	20.6017729	19.6471416	3.42	5.8	1.0
06/01/2023	03 11 22.905	17 29 40.41	20.5961352	19.6469878	3.42	5.8	1.0
06/02/2023	03 11 36.265	17 30 33.44	20.5902470	19.6468340	3.42	5.8	1.0
06/03/2023	03 11 49.570	17 31 26.16	20.5841099	19.6466801	3.42	5.8	1.1
06/04/2023	03 12 02.818	17 32 18.59	20.5777255	19.6465262	3.43	5.8	1.1
06/05/2023	03 12 16.006	17 33 10.72	20.5710953	19.6463723	3.43	5.8	1.2
06/06/2023	03 12 29.128	17 34 02.54	20.5642208	19.6462184	3.43	5.8	1.2
06/07/2023	03 12 42.181	17 34 54.03	20.5571035	19.6460644	3.43	5.8	1.3
06/08/2023	03 12 55.158	17 35 45.18	20.5497448	19.6459104	3.43	5.8	1.3
06/09/2023	03 13 08.058	17 36 35.95	20.5421460	19.6457564	3.43	5.8	1.3
06/10/2023	03 13 20.878	17 37 26.33	20.5343086	19.6456024	3.43	5.8	1.4
06/11/2023	03 13 33.616	17 38 16.30	20.5262342	19.6454483	3.43	5.8	1.4
06/12/2023	03 13 46.272	17 39 05.86	20.5179243	19.6452942	3.44	5.8	1.5
06/13/2023	03 13 58.845	17 39 55.00	20.5093806	19.6451401	3.44	5.8	1.5
06/14/2023	03 14 11.334	17 40 43.73	20.5006052	19.6449859	3.44	5.8	1.5
06/15/2023	03 14 23.738	17 41 32.05	20.4915999	19.6448318	3.44	5.8	1.6
06/16/2023	03 14 36.053	17 42 19.95	20.4823671	19.6446776	3.44	5.8	1.6
06/17/2023	03 14 48.276	17 43 07.43	20.4729089	19.6445233	3.44	5.8	1.7
06/18/2023	03 15 00.404	17 43 54.49	20.4632279	19.6443691	3.44	5.8	1.7
06/19/2023	03 15 12.431	17 44 41.11	20.4533265	19.6442148	3.45	5.8	1.7
06/20/2023	03 15 24.356	17 45 27.28	20.4432075	19.6440605	3.45	5.8	1.8
06/21/2023	03 15 36.173	17 46 12.98	20.4328735	19.6439062	3.45	5.8	1.8
06/22/2023	03 15 47.880	17 46 58.19	20.4223275	19.6437518	3.45	5.8	1.9
06/23/2023	03 15 59.474	17 47 42.91	20.4115722	19.6435975	3.45	5.8	1.9
06/24/2023	03 16 10.953	17 48 27.13	20.4006106	19.6434431	3.45	5.8	1.9
06/25/2023	03 16 22.316	17 49 10.82	20.3894457	19.6432886	3.46	5.8	2.0
06/26/2023	03 16 33.560	17 49 53.98	20.3780805	19.6431342	3.46	5.8	2.0
06/27/2023	03 16 44.685	17 50 36.62	20.3665180	19.6429797	3.46	5.8	2.0
06/28/2023	03 16 55.691	17 51 18.72	20.3547614	19.6428252	3.46	5.8	2.1
06/29/2023	03 17 06.575	17 52 00.28	20.3428138	19.6426707	3.46	5.8	2.1
06/30/2023	03 17 17.338	17 52 41.32	20.3306781	19.6425161	3.47	5.8	2.1
07/01/2023	03 17 27.978	17 53 21.83	20.3183576	19.6423615	3.47	5.8	2.2
07/02/2023	03 17 38.492	17 54 01.83	20.3058552	19.6422069	3.47	5.8	2.2
07/03/2023	03 17 48.877	17 54 41.30	20.2931740	19.6420523	3.47	5.8	2.2
07/04/2023	03 17 59.128	17 55 20.24	20.2803167	19.6418976	3.48	5.8	2.2
07/05/2023	03 18 09.241	17 55 58.63	20.2672862	19.6417429	3.48	5.8	2.3
07/06/2023	03 18 19.212	17 56 36.44	20.2540853	19.6415882	3.48	5.8	2.3
07/07/2023	03 18 29.038	17 57 13.66	20.2407167	19.6414334	3.48	5.8	2.3
07/08/2023	03 18 38.719	17 57 50.27	20.2271834	19.6412787	3.48	5.8	2.4
07/09/2023	03 18 48.254	17 58 26.25	20.2134883	19.6411239	3.49	5.8	2.4
07/10/2023	03 18 57.644	17 59 01.62	20.1996343	19.6409691	3.49	5.8	2.4
07/11/2023	03 19 06.888	17 59 36.38	20.1856248	19.6408142	3.49	5.8	2.5
07/12/2023	03 19 15.985	18 00 10.53	20.1714630	19.6406593	3.49	5.8	2.5
07/13/2023	03 19 24.933	18 00 44.07	20.1571524	19.6405044	3.50	5.8	2.5
07/14/2023	03 19 33.728	18 01 17.01	20.1426966	19.6403495	3.50	5.8	2.5
07/15/2023	03 19 42.368	18 01 49.33	20.1280993	19.6401946	3.50	5.8	2.6
07/16/2023	03 19 50.850	18 02 21.04	20.1133644	19.6400396	3.50	5.8	2.6
07/17/2023	03 19 59.169	18 02 52.11	20.0984957	19.6398846	3.51	5.8	2.6
07/18/2023	03 20 07.324	18 03 22.54	20.0834972	19.6397296	3.51	5.8	2.6

Uranus - Apparent data

Date	Right Ascension	Declination	Earth Distance	Solar Distance	Equatorial Diameter	Mag.	Phase Angle
0 h TT	h m s	d m s	au	au	arc sec		deg.
07/19/2023	03 20 15.310	18 03 52.31	20.0683730	19.6395745	3.51	5.8	2.7
07/20/2023	03 20 23.127	18 04 21.42	20.0531273	19.6394194	3.51	5.8	2.7
07/21/2023	03 20 30.772	18 04 49.84	20.0377641	19.6392643	3.52	5.8	2.7
07/22/2023	03 20 38.245	18 05 17.58	20.0222877	19.6391092	3.52	5.8	2.7
07/23/2023	03 20 45.543	18 05 44.63	20.0067023	19.6389540	3.52	5.8	2.7
07/24/2023	03 20 52.668	18 06 10.98	19.9910122	19.6387988	3.53	5.8	2.7
07/25/2023	03 20 59.618	18 06 36.64	19.9752216	19.6386436	3.53	5.8	2.8
07/26/2023	03 21 06.394	18 07 01.60	19.9593348	19.6384884	3.53	5.8	2.8
07/27/2023	03 21 12.994	18 07 25.88	19.9433561	19.6383331	3.53	5.8	2.8
07/28/2023	03 21 19.420	18 07 49.47	19.9272897	19.6381778	3.54	5.8	2.8
07/29/2023	03 21 25.668	18 08 12.39	19.9111399	19.6380225	3.54	5.8	2.8
07/30/2023	03 21 31.738	18 08 34.65	19.8949107	19.6378672	3.54	5.8	2.8
07/31/2023	03 21 37.625	18 08 56.22	19.8786063	19.6377118	3.55	5.8	2.8
08/01/2023	03 21 43.326	18 09 17.12	19.8622306	19.6375564	3.55	5.8	2.8
08/02/2023	03 21 48.838	18 09 37.31	19.8457874	19.6374010	3.55	5.8	2.9
08/03/2023	03 21 54.158	18 09 56.78	19.8292808	19.6372455	3.55	5.8	2.9
08/04/2023	03 21 59.286	18 10 15.50	19.8127144	19.6370901	3.56	5.8	2.9
08/05/2023	03 22 04.222	18 10 33.48	19.7960923	19.6369346	3.56	5.8	2.9
08/06/2023	03 22 08.967	18 10 50.70	19.7794184	19.6367790	3.56	5.8	2.9
08/07/2023	03 22 13.522	18 11 07.19	19.7626968	19.6366235	3.57	5.8	2.9
08/08/2023	03 22 17.887	18 11 22.95	19.7459319	19.6364679	3.57	5.8	2.9
08/09/2023	03 22 22.061	18 11 37.98	19.7291279	19.6363123	3.57	5.8	2.9
08/10/2023	03 22 26.043	18 11 52.29	19.7122896	19.6361567	3.58	5.8	2.9
08/11/2023	03 22 29.830	18 12 05.88	19.6954214	19.6360010	3.58	5.8	2.9
08/12/2023	03 22 33.419	18 12 18.74	19.6785281	19.6358453	3.58	5.8	2.9
08/13/2023	03 22 36.809	18 12 30.87	19.6616144	19.6356896	3.58	5.7	2.9
08/14/2023	03 22 39.997	18 12 42.26	19.6446853	19.6355338	3.59	5.7	2.9
08/15/2023	03 22 42.982	18 12 52.90	19.6277455	19.6353781	3.59	5.7	2.9
08/16/2023	03 22 45.762	18 13 02.77	19.6108001	19.6352223	3.59	5.7	2.9
08/17/2023	03 22 48.337	18 13 11.88	19.5938541	19.6350664	3.60	5.7	2.9
08/18/2023	03 22 50.706	18 13 20.22	19.5769123	19.6349106	3.60	5.7	2.9
08/19/2023	03 22 52.870	18 13 27.78	19.5599798	19.6347547	3.60	5.7	2.9
08/20/2023	03 22 54.830	18 13 34.57	19.5430617	19.6345988	3.61	5.7	2.9
08/21/2023	03 22 56.586	18 13 40.58	19.5261628	19.6344429	3.61	5.7	2.9
08/22/2023	03 22 58.139	18 13 45.83	19.5092882	19.6342869	3.61	5.7	2.9
08/23/2023	03 22 59.491	18 13 50.32	19.4924427	19.6341309	3.62	5.7	2.9
08/24/2023	03 23 00.641	18 13 54.06	19.4756314	19.6339749	3.62	5.7	2.9
08/25/2023	03 23 01.591	18 13 57.06	19.4588590	19.6338188	3.62	5.7	2.9
08/26/2023	03 23 02.339	18 13 59.33	19.4421303	19.6336628	3.63	5.7	2.9
08/27/2023	03 23 02.884	18 14 00.88	19.4254501	19.6335067	3.63	5.7	2.9
08/28/2023	03 23 03.225	18 14 01.69	19.4088227	19.6333505	3.63	5.7	2.9
08/29/2023	03 23 03.359	18 14 01.77	19.3922528	19.6331944	3.63	5.7	2.9
08/30/2023	03 23 03.285	18 14 01.09	19.3757448	19.6330382	3.64	5.7	2.8
08/31/2023	03 23 03.002	18 13 59.64	19.3593029	19.6328820	3.64	5.7	2.8
09/01/2023	03 23 02.513	18 13 57.41	19.3429314	19.6327257	3.64	5.7	2.8
09/02/2023	03 23 01.818	18 13 54.40	19.3266347	19.6325695	3.65	5.7	2.8
09/03/2023	03 23 00.923	18 13 50.62	19.3104173	19.6324132	3.65	5.7	2.8
09/04/2023	03 22 59.828	18 13 46.09	19.2942835	19.6322568	3.65	5.7	2.8
09/05/2023	03 22 58.534	18 13 40.81	19.2782382	19.6321005	3.66	5.7	2.8
09/06/2023	03 22 57.041	18 13 34.81	19.2622860	19.6319441	3.66	5.7	2.7

Uranus - Apparent data

Date 0 h TT	Earth			Solar	Equatorial	Mag.	Phase Angle deg.
	Right Ascension	Declination	Distance	Distance	Diameter		
	h m s	d m s	au	au	arc sec		
09/07/2023	03 22 55.349	18 13 28.08	19.2464319	19.6317877	3.66	5.7	2.7
09/08/2023	03 22 53.457	18 13 20.63	19.2306806	19.6316312	3.67	5.7	2.7
09/09/2023	03 22 51.363	18 13 12.46	19.2150372	19.6314748	3.67	5.7	2.7
09/10/2023	03 22 49.068	18 13 03.55	19.1995066	19.6313183	3.67	5.7	2.7
09/11/2023	03 22 46.571	18 12 53.91	19.1840939	19.6311617	3.67	5.7	2.7
09/12/2023	03 22 43.873	18 12 43.53	19.1688040	19.6310052	3.68	5.7	2.6
09/13/2023	03 22 40.974	18 12 32.41	19.1536419	19.6308486	3.68	5.7	2.6
09/14/2023	03 22 37.877	18 12 20.55	19.1386126	19.6306920	3.68	5.7	2.6
09/15/2023	03 22 34.583	18 12 07.95	19.1237210	19.6305354	3.69	5.7	2.6
09/16/2023	03 22 31.093	18 11 54.62	19.1089721	19.6303787	3.69	5.7	2.5
09/17/2023	03 22 27.412	18 11 40.56	19.0943707	19.6302220	3.69	5.7	2.5
09/18/2023	03 22 23.542	18 11 25.78	19.0799217	19.6300653	3.69	5.7	2.5
09/19/2023	03 22 19.485	18 11 10.30	19.0656298	19.6299085	3.70	5.7	2.4
09/20/2023	03 22 15.245	18 10 54.14	19.0514996	19.6297517	3.70	5.7	2.4
09/21/2023	03 22 10.822	18 10 37.30	19.0375357	19.6295949	3.70	5.7	2.4
09/22/2023	03 22 06.219	18 10 19.80	19.0237425	19.6294380	3.70	5.7	2.4
09/23/2023	03 22 01.437	18 10 01.66	19.0101245	19.6292812	3.71	5.7	2.3
09/24/2023	03 21 56.476	18 09 42.88	18.9966857	19.6291243	3.71	5.7	2.3
09/25/2023	03 21 51.335	18 09 23.45	18.9834302	19.6289673	3.71	5.7	2.3
09/26/2023	03 21 46.016	18 09 03.38	18.9703620	19.6288104	3.72	5.7	2.2
09/27/2023	03 21 40.520	18 08 42.65	18.9574850	19.6286534	3.72	5.7	2.2
09/28/2023	03 21 34.848	18 08 21.25	18.9448027	19.6284964	3.72	5.7	2.2
09/29/2023	03 21 29.006	18 07 59.19	18.9323190	19.6283393	3.72	5.7	2.1
09/30/2023	03 21 22.997	18 07 36.49	18.9200375	19.6281822	3.73	5.7	2.1
10/01/2023	03 21 16.827	18 07 13.16	18.9079620	19.6280251	3.73	5.7	2.1
10/02/2023	03 21 10.499	18 06 49.21	18.8960962	19.6278680	3.73	5.7	2.0
10/03/2023	03 21 04.015	18 06 24.69	18.8844441	19.6277108	3.73	5.7	2.0
10/04/2023	03 20 57.377	18 05 59.58	18.8730096	19.6275536	3.73	5.7	1.9
10/05/2023	03 20 50.585	18 05 33.92	18.8617967	19.6273964	3.74	5.7	1.9
10/06/2023	03 20 43.641	18 05 07.69	18.8508093	19.6272391	3.74	5.7	1.9
10/07/2023	03 20 36.545	18 04 40.91	18.8400514	19.6270818	3.74	5.7	1.8
10/08/2023	03 20 29.300	18 04 13.57	18.8295270	19.6269245	3.74	5.7	1.8
10/09/2023	03 20 21.908	18 03 45.68	18.8192400	19.6267672	3.75	5.6	1.7
10/10/2023	03 20 14.371	18 03 17.23	18.8091941	19.6266098	3.75	5.6	1.7
10/11/2023	03 20 06.693	18 02 48.25	18.7993932	19.6264524	3.75	5.6	1.7
10/12/2023	03 19 58.878	18 02 18.73	18.7898410	19.6262950	3.75	5.6	1.6
10/13/2023	03 19 50.930	18 01 48.69	18.7805410	19.6261375	3.75	5.6	1.6
10/14/2023	03 19 42.854	18 01 18.14	18.7714969	19.6259801	3.75	5.6	1.5
10/15/2023	03 19 34.653	18 00 47.09	18.7627120	19.6258225	3.76	5.6	1.5
10/16/2023	03 19 26.334	18 00 15.58	18.7541897	19.6256650	3.76	5.6	1.4
10/17/2023	03 19 17.900	17 59 43.61	18.7459331	19.6255074	3.76	5.6	1.4
10/18/2023	03 19 09.356	17 59 11.22	18.7379453	19.6253498	3.76	5.6	1.3
10/19/2023	03 19 00.705	17 58 38.42	18.7302290	19.6251922	3.76	5.6	1.3
10/20/2023	03 18 51.950	17 58 05.23	18.7227871	19.6250345	3.76	5.6	1.2
10/21/2023	03 18 43.093	17 57 31.67	18.7156220	19.6248768	3.77	5.6	1.2
10/22/2023	03 18 34.136	17 56 57.74	18.7087360	19.6247191	3.77	5.6	1.1
10/23/2023	03 18 25.081	17 56 23.44	18.7021315	19.6245614	3.77	5.6	1.1
10/24/2023	03 18 15.932	17 55 48.78	18.6958103	19.6244036	3.77	5.6	1.0
10/25/2023	03 18 06.692	17 55 13.76	18.6897743	19.6242458	3.77	5.6	1.0
10/26/2023	03 17 57.366	17 54 38.38	18.6840255	19.6240880	3.77	5.6	0.9

Uranus - Apparent data

Date 0 h TT	Right Ascension			Declination			Earth	Solar	Equatorial	Mag.	Phase Angle deg.
	h	m	s	d	m	s	Distance au	Distance au	Diameter arc sec		
10/27/2023	03	17	47.961	17	54	02.65	18.6785654	19.6239301	3.77	5.6	0.9
10/28/2023	03	17	38.483	17	53	26.61	18.6733958	19.6237722	3.77	5.6	0.9
10/29/2023	03	17	28.936	17	52	50.28	18.6685185	19.6236143	3.78	5.6	0.8
10/30/2023	03	17	19.327	17	52	13.68	18.6639350	19.6234564	3.78	5.6	0.8
10/31/2023	03	17	09.658	17	51	36.85	18.6596471	19.6232984	3.78	5.6	0.7
11/01/2023	03	16	59.932	17	50	59.79	18.6556567	19.6231404	3.78	5.6	0.7
11/02/2023	03	16	50.151	17	50	22.52	18.6519654	19.6229824	3.78	5.6	0.6
11/03/2023	03	16	40.317	17	49	45.05	18.6485750	19.6228243	3.78	5.6	0.6
11/04/2023	03	16	30.434	17	49	07.38	18.6454870	19.6226662	3.78	5.6	0.5
11/05/2023	03	16	20.505	17	48	29.53	18.6427030	19.6225081	3.78	5.6	0.5
11/06/2023	03	16	10.534	17	47	51.51	18.6402245	19.6223500	3.78	5.6	0.4
11/07/2023	03	16	00.525	17	47	13.32	18.6380527	19.6221918	3.78	5.6	0.3
11/08/2023	03	15	50.484	17	46	34.97	18.6361890	19.6220336	3.78	5.6	0.3
11/09/2023	03	15	40.415	17	45	56.49	18.6346345	19.6218754	3.78	5.6	0.2
11/10/2023	03	15	30.325	17	45	17.90	18.6333901	19.6217171	3.78	5.6	0.2
11/11/2023	03	15	20.219	17	44	39.20	18.6324567	19.6215588	3.78	5.6	0.1
11/12/2023	03	15	10.103	17	44	00.44	18.6318351	19.6214005	3.78	5.6	0.1
11/13/2023	03	14	59.983	17	43	21.64	18.6315257	19.6212421	3.78	5.6	0.0
11/14/2023	03	14	49.863	17	42	42.81	18.6315290	19.6210838	3.78	5.6	0.0
11/15/2023	03	14	39.750	17	42	04.00	18.6318451	19.6209254	3.78	5.6	0.1
11/16/2023	03	14	29.646	17	41	25.23	18.6324741	19.6207669	3.78	5.6	0.1
11/17/2023	03	14	19.554	17	40	46.51	18.6334156	19.6206085	3.78	5.6	0.2
11/18/2023	03	14	09.477	17	40	07.85	18.6346693	19.6204500	3.78	5.6	0.2
11/19/2023	03	13	59.418	17	39	29.27	18.6362346	19.6202915	3.78	5.6	0.3
11/20/2023	03	13	49.380	17	38	50.76	18.6381106	19.6201330	3.78	5.6	0.4
11/21/2023	03	13	39.368	17	38	12.33	18.6402964	19.6199744	3.78	5.6	0.4
11/22/2023	03	13	29.387	17	37	34.00	18.6427911	19.6198158	3.78	5.6	0.5
11/23/2023	03	13	19.443	17	36	55.77	18.6455933	19.6196572	3.78	5.6	0.5
11/24/2023	03	13	09.543	17	36	17.68	18.6487019	19.6194985	3.78	5.6	0.6
11/25/2023	03	12	59.692	17	35	39.74	18.6521158	19.6193398	3.78	5.6	0.6
11/26/2023	03	12	49.897	17	35	01.99	18.6558336	19.6191811	3.78	5.6	0.7
11/27/2023	03	12	40.161	17	34	24.47	18.6598542	19.6190224	3.78	5.6	0.7
11/28/2023	03	12	30.487	17	33	47.18	18.6641762	19.6188636	3.78	5.6	0.8
11/29/2023	03	12	20.878	17	33	10.14	18.6687985	19.6187048	3.78	5.6	0.8
11/30/2023	03	12	11.336	17	32	33.37	18.6737197	19.6185460	3.77	5.6	0.9
12/01/2023	03	12	01.864	17	31	56.88	18.6789385	19.6183872	3.77	5.6	0.9
12/02/2023	03	11	52.464	17	31	20.67	18.6844534	19.6182283	3.77	5.6	1.0
12/03/2023	03	11	43.140	17	30	44.75	18.6902630	19.6180694	3.77	5.6	1.0
12/04/2023	03	11	33.898	17	30	09.14	18.6963656	19.6179105	3.77	5.6	1.1
12/05/2023	03	11	24.740	17	29	33.85	18.7027595	19.6177515	3.77	5.6	1.1
12/06/2023	03	11	15.672	17	28	58.88	18.7094428	19.6175925	3.77	5.6	1.2
12/07/2023	03	11	06.699	17	28	24.27	18.7164136	19.6174335	3.77	5.6	1.2
12/08/2023	03	10	57.827	17	27	50.03	18.7236697	19.6172745	3.76	5.6	1.2
12/09/2023	03	10	49.061	17	27	16.18	18.7312089	19.6171154	3.76	5.6	1.3
12/10/2023	03	10	40.405	17	26	42.75	18.7390288	19.6169563	3.76	5.6	1.3
12/11/2023	03	10	31.865	17	26	09.77	18.7471270	19.6167972	3.76	5.6	1.4
12/12/2023	03	10	23.445	17	25	37.26	18.7555006	19.6166380	3.76	5.6	1.4
12/13/2023	03	10	15.149	17	25	05.24	18.7641469	19.6164788	3.76	5.6	1.5
12/14/2023	03	10	06.978	17	24	33.74	18.7730626	19.6163196	3.75	5.6	1.5
12/15/2023	03	09	58.935	17	24	02.77	18.7822446	19.6161604	3.75	5.6	1.6

Uranus - Apparent data

Date	Right Ascension	Declination	Earth Distance	Solar Distance	Equatorial Diameter	Mag.	Phase Angle
0 h TT	h m s	d m s	au	au	arc sec		deg.
12/16/2023	03 09 51.020	17 23 32.32	18.7916893	19.6160011	3.75	5.6	1.6
12/17/2023	03 09 43.236	17 23 02.41	18.8013931	19.6158419	3.75	5.6	1.7
12/18/2023	03 09 35.587	17 22 33.02	18.8113523	19.6156825	3.75	5.6	1.7
12/19/2023	03 09 28.076	17 22 04.17	18.8215630	19.6155232	3.74	5.6	1.8
12/20/2023	03 09 20.708	17 21 35.87	18.8320213	19.6153638	3.74	5.7	1.8
12/21/2023	03 09 13.488	17 21 08.14	18.8427232	19.6152044	3.74	5.7	1.8
12/22/2023	03 09 06.422	17 20 41.00	18.8536648	19.6150450	3.74	5.7	1.9
12/23/2023	03 08 59.513	17 20 14.47	18.8648423	19.6148856	3.74	5.7	1.9
12/24/2023	03 08 52.765	17 19 48.58	18.8762517	19.6147261	3.73	5.7	1.9
12/25/2023	03 08 46.179	17 19 23.35	18.8878891	19.6145666	3.73	5.7	2.0
12/26/2023	03 08 39.757	17 18 58.79	18.8997507	19.6144070	3.73	5.7	2.0
12/27/2023	03 08 33.500	17 18 34.90	18.9118326	19.6142475	3.73	5.7	2.1
12/28/2023	03 08 27.409	17 18 11.69	18.9241310	19.6140879	3.72	5.7	2.1
12/29/2023	03 08 21.485	17 17 49.17	18.9366419	19.6139283	3.72	5.7	2.1
12/30/2023	03 08 15.729	17 17 27.34	18.9493614	19.6137686	3.72	5.7	2.2
12/31/2023	03 08 10.145	17 17 06.19	18.9622855	19.6136090	3.72	5.7	2.2
01/01/2024	03 08 04.735	17 16 45.74	18.9754101	19.6134493	3.71	5.7	2.2
01/02/2024	03 07 59.501	17 16 26.00	18.9887312	19.6132896	3.71	5.7	2.3



## Neptune - Apparent data

Date	Right Ascension	Declination	Earth Distance	Solar Distance	Equatorial Diameter	Mag.	Phase Angle
0 h TT	h m s	d m s	au	au	arc sec		deg.
12/31/2022	23 35 38.248	-03 55 34.94	30.1754908	29.9125670	2.26	7.9	1.8
01/01/2023	23 35 41.655	-03 55 10.94	30.1920899	29.9125443	2.26	7.9	1.8
01/02/2023	23 35 45.183	-03 54 46.18	30.2085981	29.9125215	2.26	7.9	1.8
01/03/2023	23 35 48.831	-03 54 20.65	30.2250109	29.9124987	2.26	7.9	1.8
01/04/2023	23 35 52.598	-03 53 54.37	30.2413237	29.9124760	2.26	7.9	1.8
01/05/2023	23 35 56.483	-03 53 27.36	30.2575319	29.9124532	2.26	7.9	1.7
01/06/2023	23 36 00.483	-03 52 59.62	30.2736310	29.9124304	2.26	7.9	1.7
01/07/2023	23 36 04.597	-03 52 31.17	30.2896165	29.9124076	2.25	7.9	1.7
01/08/2023	23 36 08.823	-03 52 02.02	30.3054840	29.9123848	2.25	7.9	1.7
01/09/2023	23 36 13.158	-03 51 32.19	30.3212291	29.9123620	2.25	7.9	1.7
01/10/2023	23 36 17.602	-03 51 01.68	30.3368473	29.9123392	2.25	7.9	1.7
01/11/2023	23 36 22.154	-03 50 30.49	30.3523342	29.9123163	2.25	7.9	1.7
01/12/2023	23 36 26.812	-03 49 58.64	30.3676855	29.9122935	2.25	7.9	1.7
01/13/2023	23 36 31.577	-03 49 26.12	30.3828967	29.9122706	2.25	7.9	1.6
01/14/2023	23 36 36.448	-03 48 52.93	30.3979634	29.9122478	2.25	7.9	1.6
01/15/2023	23 36 41.425	-03 48 19.08	30.4128812	29.9122249	2.25	7.9	1.6
01/16/2023	23 36 46.510	-03 47 44.57	30.4276456	29.9122020	2.24	7.9	1.6
01/17/2023	23 36 51.700	-03 47 09.38	30.4422521	29.9121791	2.24	7.9	1.6
01/18/2023	23 36 56.998	-03 46 33.53	30.4566964	29.9121562	2.24	7.9	1.6
01/19/2023	23 37 02.400	-03 45 57.03	30.4709738	29.9121333	2.24	7.9	1.5
01/20/2023	23 37 07.905	-03 45 19.90	30.4850798	29.9121104	2.24	7.9	1.5
01/21/2023	23 37 13.509	-03 44 42.16	30.4990098	29.9120875	2.24	7.9	1.5
01/22/2023	23 37 19.208	-03 44 03.83	30.5127595	29.9120646	2.24	7.9	1.5
01/23/2023	23 37 24.998	-03 43 24.95	30.5263244	29.9120416	2.24	7.9	1.5
01/24/2023	23 37 30.877	-03 42 45.51	30.5397003	29.9120187	2.24	7.9	1.4
01/25/2023	23 37 36.845	-03 42 05.53	30.5528833	29.9119957	2.24	7.9	1.4
01/26/2023	23 37 42.901	-03 41 25.00	30.5658695	29.9119728	2.23	7.9	1.4
01/27/2023	23 37 49.046	-03 40 43.92	30.5786553	29.9119498	2.23	7.9	1.4
01/28/2023	23 37 55.280	-03 40 02.30	30.5912374	29.9119268	2.23	7.9	1.3
01/29/2023	23 38 01.602	-03 39 20.13	30.6036124	29.9119038	2.23	7.9	1.3
01/30/2023	23 38 08.010	-03 38 37.43	30.6157770	29.9118808	2.23	7.9	1.3
01/31/2023	23 38 14.504	-03 37 54.22	30.6277283	29.9118578	2.23	7.9	1.3
02/01/2023	23 38 21.080	-03 37 10.50	30.6394632	29.9118348	2.23	7.9	1.3
02/02/2023	23 38 27.736	-03 36 26.31	30.6509788	29.9118118	2.23	7.9	1.2
02/03/2023	23 38 34.469	-03 35 41.64	30.6622721	29.9117888	2.23	7.9	1.2
02/04/2023	23 38 41.277	-03 34 56.53	30.6733404	29.9117657	2.23	7.9	1.2
02/05/2023	23 38 48.158	-03 34 10.99	30.6841809	29.9117427	2.23	7.9	1.2
02/06/2023	23 38 55.108	-03 33 25.03	30.6947908	29.9117196	2.22	7.9	1.1
02/07/2023	23 39 02.127	-03 32 38.65	30.7051676	29.9116966	2.22	7.9	1.1
02/08/2023	23 39 09.214	-03 31 51.88	30.7153084	29.9116735	2.22	7.9	1.1
02/09/2023	23 39 16.366	-03 31 04.71	30.7252107	29.9116504	2.22	7.9	1.1
02/10/2023	23 39 23.584	-03 30 17.15	30.7348718	29.9116273	2.22	7.9	1.0
02/11/2023	23 39 30.867	-03 29 29.20	30.7442891	29.9116042	2.22	7.9	1.0
02/12/2023	23 39 38.214	-03 28 40.87	30.7534602	29.9115811	2.22	7.9	1.0
02/13/2023	23 39 45.626	-03 27 52.15	30.7623822	29.9115580	2.22	7.9	0.9
02/14/2023	23 39 53.101	-03 27 03.06	30.7710527	29.9115349	2.22	7.9	0.9
02/15/2023	23 40 00.637	-03 26 13.61	30.7794691	29.9115117	2.22	7.9	0.9
02/16/2023	23 40 08.233	-03 25 23.81	30.7876288	29.9114886	2.22	8.0	0.9
02/17/2023	23 40 15.884	-03 24 33.69	30.7955293	29.9114655	2.22	8.0	0.8
02/18/2023	23 40 23.588	-03 23 43.27	30.8031680	29.9114423	2.22	8.0	0.8

## Neptune - Apparent data

Date 0 h TT	Right Ascension			Declination			Earth	Solar	Equatorial	Mag.	Phase Angle deg.
	h	m	s	d	m	s	Distance au	Distance au	Diameter arc sec		
02/19/2023	23	40	31.339	-03	22	52.58	30.8105426	29.9114191	2.22	8.0	0.8
02/20/2023	23	40	39.134	-03	22	01.63	30.8176507	29.9113960	2.22	8.0	0.7
02/21/2023	23	40	46.971	-03	21	10.46	30.8244904	29.9113728	2.22	8.0	0.7
02/22/2023	23	40	54.850	-03	20	19.04	30.8310597	29.9113496	2.21	8.0	0.7
02/23/2023	23	41	02.770	-03	19	27.39	30.8373569	29.9113264	2.21	8.0	0.7
02/24/2023	23	41	10.732	-03	18	35.50	30.8433807	29.9113032	2.21	8.0	0.6
02/25/2023	23	41	18.736	-03	17	43.38	30.8491298	29.9112800	2.21	8.0	0.6
02/26/2023	23	41	26.778	-03	16	51.05	30.8546031	29.9112568	2.21	8.0	0.6
02/27/2023	23	41	34.859	-03	15	58.50	30.8597995	29.9112335	2.21	8.0	0.5
02/28/2023	23	41	42.974	-03	15	05.78	30.8647181	29.9112103	2.21	8.0	0.5
03/01/2023	23	41	51.121	-03	14	12.88	30.8693582	29.9111870	2.21	8.0	0.5
03/02/2023	23	41	59.296	-03	13	19.84	30.8737189	29.9111638	2.21	8.0	0.4
03/03/2023	23	42	07.499	-03	12	26.67	30.8777996	29.9111405	2.21	8.0	0.4
03/04/2023	23	42	15.724	-03	11	33.39	30.8815996	29.9111173	2.21	8.0	0.4
03/05/2023	23	42	23.971	-03	10	40.01	30.8851183	29.9110940	2.21	8.0	0.3
03/06/2023	23	42	32.237	-03	09	46.55	30.8883552	29.9110707	2.21	8.0	0.3
03/07/2023	23	42	40.520	-03	08	53.01	30.8913098	29.9110474	2.21	8.0	0.3
03/08/2023	23	42	48.819	-03	07	59.41	30.8939817	29.9110241	2.21	8.0	0.3
03/09/2023	23	42	57.133	-03	07	05.75	30.8963703	29.9110008	2.21	8.0	0.2
03/10/2023	23	43	05.462	-03	06	12.03	30.8984753	29.9109775	2.21	8.0	0.2
03/11/2023	23	43	13.805	-03	05	18.25	30.9002963	29.9109542	2.21	8.0	0.2
03/12/2023	23	43	22.161	-03	04	24.42	30.9018327	29.9109308	2.21	8.0	0.1
03/13/2023	23	43	30.530	-03	03	30.56	30.9030843	29.9109075	2.21	8.0	0.1
03/14/2023	23	43	38.909	-03	02	36.66	30.9040507	29.9108842	2.21	8.0	0.1
03/15/2023	23	43	47.297	-03	01	42.74	30.9047313	29.9108608	2.21	8.0	0.1
03/16/2023	23	43	55.690	-03	00	48.84	30.9051260	29.9108375	2.21	8.0	0.0
03/17/2023	23	44	04.085	-02	59	54.96	30.9052344	29.9108141	2.21	8.0	0.0
03/18/2023	23	44	12.478	-02	59	01.13	30.9050563	29.9107907	2.21	8.0	0.1
03/19/2023	23	44	20.865	-02	58	07.39	30.9045916	29.9107673	2.21	8.0	0.1
03/20/2023	23	44	29.243	-02	57	13.74	30.9038403	29.9107439	2.21	8.0	0.1
03/21/2023	23	44	37.611	-02	56	20.18	30.9028027	29.9107205	2.21	8.0	0.2
03/22/2023	23	44	45.969	-02	55	26.73	30.9014791	29.9106971	2.21	8.0	0.2
03/23/2023	23	44	54.317	-02	54	33.38	30.8998703	29.9106737	2.21	8.0	0.2
03/24/2023	23	45	02.654	-02	53	40.14	30.8979770	29.9106503	2.21	8.0	0.3
03/25/2023	23	45	10.981	-02	52	47.00	30.8958002	29.9106269	2.21	8.0	0.3
03/26/2023	23	45	19.294	-02	51	53.99	30.8933410	29.9106035	2.21	8.0	0.3
03/27/2023	23	45	27.591	-02	51	01.12	30.8906008	29.9105800	2.21	8.0	0.4
03/28/2023	23	45	35.870	-02	50	08.41	30.8875807	29.9105566	2.21	8.0	0.4
03/29/2023	23	45	44.128	-02	49	15.89	30.8842822	29.9105331	2.21	8.0	0.4
03/30/2023	23	45	52.361	-02	48	23.56	30.8807067	29.9105097	2.21	8.0	0.5
03/31/2023	23	46	00.567	-02	47	31.44	30.8768557	29.9104862	2.21	8.0	0.5
04/01/2023	23	46	08.743	-02	46	39.56	30.8727307	29.9104627	2.21	8.0	0.5
04/02/2023	23	46	16.888	-02	45	47.92	30.8683332	29.9104392	2.21	8.0	0.5
04/03/2023	23	46	25.000	-02	44	56.53	30.8636648	29.9104158	2.21	8.0	0.6
04/04/2023	23	46	33.078	-02	44	05.41	30.8587272	29.9103923	2.21	8.0	0.6
04/05/2023	23	46	41.120	-02	43	14.55	30.8535219	29.9103688	2.21	8.0	0.6
04/06/2023	23	46	49.127	-02	42	23.96	30.8480507	29.9103453	2.21	8.0	0.7
04/07/2023	23	46	57.097	-02	41	33.63	30.8423151	29.9103218	2.21	8.0	0.7
04/08/2023	23	47	05.032	-02	40	43.59	30.8363169	29.9102982	2.21	8.0	0.7
04/09/2023	23	47	12.928	-02	39	53.81	30.8300575	29.9102747	2.22	8.0	0.7

## Neptune - Apparent data

Date 0 h TT	Right Ascension			Declination			Earth	Solar	Equatorial	Mag.	Phase Angle deg.
	h	m	s	d	m	s	Distance au	Distance au	Diameter arc sec		
04/10/2023	23	47	20.787	-02	39	04.33	30.8235387	29.9102512	2.22	8.0	0.8
04/11/2023	23	47	28.605	-02	38	15.14	30.8167620	29.9102277	2.22	8.0	0.8
04/12/2023	23	47	36.380	-02	37	26.27	30.8097290	29.9102041	2.22	8.0	0.8
04/13/2023	23	47	44.108	-02	36	37.75	30.8024415	29.9101806	2.22	8.0	0.9
04/14/2023	23	47	51.785	-02	35	49.58	30.7949012	29.9101570	2.22	8.0	0.9
04/15/2023	23	47	59.409	-02	35	01.81	30.7871099	29.9101335	2.22	8.0	0.9
04/16/2023	23	48	06.976	-02	34	14.43	30.7790695	29.9101099	2.22	7.9	0.9
04/17/2023	23	48	14.486	-02	33	27.46	30.7707821	29.9100864	2.22	7.9	1.0
04/18/2023	23	48	21.938	-02	32	40.90	30.7622501	29.9100628	2.22	7.9	1.0
04/19/2023	23	48	29.331	-02	31	54.75	30.7534758	29.9100392	2.22	7.9	1.0
04/20/2023	23	48	36.667	-02	31	09.00	30.7444618	29.9100156	2.22	7.9	1.1
04/21/2023	23	48	43.944	-02	30	23.67	30.7352110	29.9099920	2.22	7.9	1.1
04/22/2023	23	48	51.163	-02	29	38.76	30.7257263	29.9099684	2.22	7.9	1.1
04/23/2023	23	48	58.319	-02	28	54.28	30.7160106	29.9099448	2.22	7.9	1.1
04/24/2023	23	49	05.412	-02	28	10.26	30.7060672	29.9099212	2.22	7.9	1.2
04/25/2023	23	49	12.438	-02	27	26.70	30.6958991	29.9098976	2.22	7.9	1.2
04/26/2023	23	49	19.395	-02	26	43.62	30.6855095	29.9098740	2.23	7.9	1.2
04/27/2023	23	49	26.280	-02	26	01.05	30.6749018	29.9098504	2.23	7.9	1.2
04/28/2023	23	49	33.092	-02	25	18.99	30.6640791	29.9098268	2.23	7.9	1.3
04/29/2023	23	49	39.827	-02	24	37.45	30.6530447	29.9098031	2.23	7.9	1.3
04/30/2023	23	49	46.485	-02	23	56.45	30.6418019	29.9097795	2.23	7.9	1.3
05/01/2023	23	49	53.066	-02	23	15.99	30.6303540	29.9097559	2.23	7.9	1.3
05/02/2023	23	49	59.567	-02	22	36.07	30.6187044	29.9097322	2.23	7.9	1.4
05/03/2023	23	50	05.989	-02	21	56.69	30.6068563	29.9097086	2.23	7.9	1.4
05/04/2023	23	50	12.333	-02	21	17.86	30.5948130	29.9096849	2.23	7.9	1.4
05/05/2023	23	50	18.597	-02	20	39.57	30.5825778	29.9096612	2.23	7.9	1.4
05/06/2023	23	50	24.782	-02	20	01.82	30.5701539	29.9096376	2.23	7.9	1.4
05/07/2023	23	50	30.888	-02	19	24.61	30.5575445	29.9096139	2.23	7.9	1.5
05/08/2023	23	50	36.913	-02	18	47.96	30.5447527	29.9095902	2.24	7.9	1.5
05/09/2023	23	50	42.855	-02	18	11.88	30.5317817	29.9095665	2.24	7.9	1.5
05/10/2023	23	50	48.710	-02	17	36.39	30.5186347	29.9095428	2.24	7.9	1.5
05/11/2023	23	50	54.475	-02	17	01.51	30.5053148	29.9095191	2.24	7.9	1.5
05/12/2023	23	51	00.148	-02	16	27.26	30.4918253	29.9094954	2.24	7.9	1.6
05/13/2023	23	51	05.726	-02	15	53.65	30.4781696	29.9094717	2.24	7.9	1.6
05/14/2023	23	51	11.207	-02	15	20.69	30.4643512	29.9094480	2.24	7.9	1.6
05/15/2023	23	51	16.593	-02	14	48.38	30.4503737	29.9094243	2.24	7.9	1.6
05/16/2023	23	51	21.882	-02	14	16.71	30.4362409	29.9094006	2.24	7.9	1.6
05/17/2023	23	51	27.077	-02	13	45.69	30.4219568	29.9093769	2.24	7.9	1.7
05/18/2023	23	51	32.176	-02	13	15.30	30.4075253	29.9093531	2.25	7.9	1.7
05/19/2023	23	51	37.181	-02	12	45.56	30.3929508	29.9093294	2.25	7.9	1.7
05/20/2023	23	51	42.088	-02	12	16.47	30.3782375	29.9093056	2.25	7.9	1.7
05/21/2023	23	51	46.897	-02	11	48.04	30.3633897	29.9092819	2.25	7.9	1.7
05/22/2023	23	51	51.606	-02	11	20.29	30.3484118	29.9092581	2.25	7.9	1.7
05/23/2023	23	51	56.212	-02	10	53.23	30.3333084	29.9092344	2.25	7.9	1.8
05/24/2023	23	52	00.713	-02	10	26.88	30.3180838	29.9092106	2.25	7.9	1.8
05/25/2023	23	52	05.107	-02	10	01.24	30.3027426	29.9091868	2.25	7.9	1.8
05/26/2023	23	52	09.394	-02	09	36.32	30.2872891	29.9091631	2.25	7.9	1.8
05/27/2023	23	52	13.571	-02	09	12.13	30.2717278	29.9091393	2.26	7.9	1.8
05/28/2023	23	52	17.640	-02	08	48.67	30.2560632	29.9091155	2.26	7.9	1.8
05/29/2023	23	52	21.598	-02	08	25.94	30.2402996	29.9090917	2.26	7.9	1.8

Neptune - Apparent data

Date	Right Ascension	Declination	Earth Distance	Solar Distance	Equatorial Diameter	Mag.	Phase Angle
0 h TT	h m s	d m s	au	au	arc sec		deg.
05/30/2023	23 52 25.447	-02 08 03.94	30.2244415	29.9090679	2.26	7.9	1.8
05/31/2023	23 52 29.187	-02 07 42.67	30.2084932	29.9090441	2.26	7.9	1.8
06/01/2023	23 52 32.819	-02 07 22.11	30.1924590	29.9090203	2.26	7.9	1.9
06/02/2023	23 52 36.343	-02 07 02.27	30.1763433	29.9089964	2.26	7.9	1.9
06/03/2023	23 52 39.759	-02 06 43.14	30.1601501	29.9089726	2.26	7.9	1.9
06/04/2023	23 52 43.069	-02 06 24.73	30.1438837	29.9089488	2.27	7.9	1.9
06/05/2023	23 52 46.269	-02 06 07.03	30.1275481	29.9089249	2.27	7.9	1.9
06/06/2023	23 52 49.358	-02 05 50.08	30.1111475	29.9089011	2.27	7.9	1.9
06/07/2023	23 52 52.332	-02 05 33.88	30.0946857	29.9088773	2.27	7.9	1.9
06/08/2023	23 52 55.189	-02 05 18.45	30.0781669	29.9088534	2.27	7.9	1.9
06/09/2023	23 52 57.928	-02 05 03.80	30.0615954	29.9088295	2.27	7.9	1.9
06/10/2023	23 53 00.547	-02 04 49.94	30.0449752	29.9088057	2.27	7.9	1.9
06/11/2023	23 53 03.047	-02 04 36.87	30.0283110	29.9087818	2.27	7.9	1.9
06/12/2023	23 53 05.429	-02 04 24.57	30.0116071	29.9087579	2.28	7.9	1.9
06/13/2023	23 53 07.694	-02 04 13.03	29.9948682	29.9087340	2.28	7.9	1.9
06/14/2023	23 53 09.844	-02 04 02.25	29.9780990	29.9087101	2.28	7.9	1.9
06/15/2023	23 53 11.878	-02 03 52.23	29.9613045	29.9086862	2.28	7.9	1.9
06/16/2023	23 53 13.796	-02 03 42.97	29.9444895	29.9086623	2.28	7.9	2.0
06/17/2023	23 53 15.598	-02 03 34.47	29.9276590	29.9086384	2.28	7.9	2.0
06/18/2023	23 53 17.282	-02 03 26.75	29.9108181	29.9086145	2.28	7.9	2.0
06/19/2023	23 53 18.847	-02 03 19.80	29.8939716	29.9085906	2.28	7.9	2.0
06/20/2023	23 53 20.291	-02 03 13.65	29.8771247	29.9085666	2.29	7.9	2.0
06/21/2023	23 53 21.613	-02 03 08.29	29.8602823	29.9085427	2.29	7.9	2.0
06/22/2023	23 53 22.813	-02 03 03.73	29.8434493	29.9085187	2.29	7.9	2.0
06/23/2023	23 53 23.889	-02 02 59.98	29.8266308	29.9084948	2.29	7.9	2.0
06/24/2023	23 53 24.844	-02 02 57.02	29.8098315	29.9084708	2.29	7.9	1.9
06/25/2023	23 53 25.675	-02 02 54.85	29.7930564	29.9084469	2.29	7.9	1.9
06/26/2023	23 53 26.386	-02 02 53.48	29.7763102	29.9084229	2.29	7.9	1.9
06/27/2023	23 53 26.976	-02 02 52.88	29.7595977	29.9083989	2.29	7.9	1.9
06/28/2023	23 53 27.447	-02 02 53.06	29.7429236	29.9083749	2.30	7.9	1.9
06/29/2023	23 53 27.800	-02 02 53.99	29.7262923	29.9083509	2.30	7.9	1.9
06/30/2023	23 53 28.038	-02 02 55.67	29.7097086	29.9083269	2.30	7.9	1.9
07/01/2023	23 53 28.160	-02 02 58.10	29.6931767	29.9083029	2.30	7.9	1.9
07/02/2023	23 53 28.167	-02 03 01.27	29.6767011	29.9082789	2.30	7.9	1.9
07/03/2023	23 53 28.057	-02 03 05.19	29.6602860	29.9082549	2.30	7.9	1.9
07/04/2023	23 53 27.829	-02 03 09.88	29.6439356	29.9082308	2.30	7.9	1.9
07/05/2023	23 53 27.481	-02 03 15.34	29.6276540	29.9082068	2.30	7.9	1.9
07/06/2023	23 53 27.011	-02 03 21.58	29.6114455	29.9081828	2.31	7.9	1.9
07/07/2023	23 53 26.418	-02 03 28.61	29.5953144	29.9081587	2.31	7.9	1.9
07/08/2023	23 53 25.703	-02 03 36.42	29.5792650	29.9081347	2.31	7.9	1.9
07/09/2023	23 53 24.869	-02 03 44.99	29.5633018	29.9081106	2.31	7.9	1.8
07/10/2023	23 53 23.918	-02 03 54.31	29.5474294	29.9080865	2.31	7.9	1.8
07/11/2023	23 53 22.852	-02 04 04.36	29.5316526	29.9080625	2.31	7.9	1.8
07/12/2023	23 53 21.672	-02 04 15.14	29.5159761	29.9080384	2.31	7.9	1.8
07/13/2023	23 53 20.379	-02 04 26.64	29.5004046	29.9080143	2.31	7.9	1.8
07/14/2023	23 53 18.972	-02 04 38.86	29.4849430	29.9079902	2.32	7.9	1.8
07/15/2023	23 53 17.453	-02 04 51.80	29.4695961	29.9079661	2.32	7.9	1.8
07/16/2023	23 53 15.820	-02 05 05.46	29.4543687	29.9079420	2.32	7.9	1.8
07/17/2023	23 53 14.073	-02 05 19.86	29.4392655	29.9079179	2.32	7.9	1.8
07/18/2023	23 53 12.211	-02 05 34.97	29.4242914	29.9078937	2.32	7.9	1.7

## Neptune - Apparent data

Date 0 h TT	Right Ascension			Declination			Earth	Solar	Equatorial	Mag.	Phase Angle deg.
	h	m	s	d	m	s	Distance au	Distance au	Diameter arc sec		
07/19/2023	23	53	10.235	-02	05	50.82	29.4094508	29.9078696	2.32	7.9	1.7
07/20/2023	23	53	08.145	-02	06	07.38	29.3947486	29.9078455	2.32	7.8	1.7
07/21/2023	23	53	05.942	-02	06	24.66	29.3801890	29.9078213	2.32	7.8	1.7
07/22/2023	23	53	03.628	-02	06	42.64	29.3657767	29.9077972	2.33	7.8	1.7
07/23/2023	23	53	01.203	-02	07	01.32	29.3515160	29.9077730	2.33	7.8	1.6
07/24/2023	23	52	58.671	-02	07	20.67	29.3374111	29.9077489	2.33	7.8	1.6
07/25/2023	23	52	56.032	-02	07	40.69	29.3234662	29.9077247	2.33	7.8	1.6
07/26/2023	23	52	53.291	-02	08	01.35	29.3096855	29.9077005	2.33	7.8	1.6
07/27/2023	23	52	50.448	-02	08	22.64	29.2960728	29.9076763	2.33	7.8	1.6
07/28/2023	23	52	47.505	-02	08	44.55	29.2826322	29.9076521	2.33	7.8	1.6
07/29/2023	23	52	44.465	-02	09	07.07	29.2693672	29.9076279	2.33	7.8	1.5
07/30/2023	23	52	41.328	-02	09	30.20	29.2562816	29.9076037	2.33	7.8	1.5
07/31/2023	23	52	38.092	-02	09	53.93	29.2433788	29.9075795	2.34	7.8	1.5
08/01/2023	23	52	34.758	-02	10	18.28	29.2306624	29.9075552	2.34	7.8	1.5
08/02/2023	23	52	31.323	-02	10	43.25	29.2181356	29.9075310	2.34	7.8	1.4
08/03/2023	23	52	27.788	-02	11	08.84	29.2058019	29.9075068	2.34	7.8	1.4
08/04/2023	23	52	24.154	-02	11	35.04	29.1936649	29.9074825	2.34	7.8	1.4
08/05/2023	23	52	20.424	-02	12	01.83	29.1817279	29.9074582	2.34	7.8	1.4
08/06/2023	23	52	16.600	-02	12	29.19	29.1699947	29.9074340	2.34	7.8	1.4
08/07/2023	23	52	12.687	-02	12	57.09	29.1584689	29.9074097	2.34	7.8	1.3
08/08/2023	23	52	08.687	-02	13	25.53	29.1471545	29.9073854	2.34	7.8	1.3
08/09/2023	23	52	04.602	-02	13	54.49	29.1360550	29.9073611	2.34	7.8	1.3
08/10/2023	23	52	00.432	-02	14	23.95	29.1251744	29.9073368	2.34	7.8	1.3
08/11/2023	23	51	56.180	-02	14	53.93	29.1145163	29.9073125	2.35	7.8	1.2
08/12/2023	23	51	51.844	-02	15	24.40	29.1040844	29.9072882	2.35	7.8	1.2
08/13/2023	23	51	47.425	-02	15	55.38	29.0938823	29.9072639	2.35	7.8	1.2
08/14/2023	23	51	42.925	-02	16	26.86	29.0839136	29.9072395	2.35	7.8	1.2
08/15/2023	23	51	38.344	-02	16	58.82	29.0741817	29.9072152	2.35	7.8	1.1
08/16/2023	23	51	33.683	-02	17	31.26	29.0646899	29.9071908	2.35	7.8	1.1
08/17/2023	23	51	28.944	-02	18	04.16	29.0554415	29.9071665	2.35	7.8	1.1
08/18/2023	23	51	24.129	-02	18	37.52	29.0464395	29.9071421	2.35	7.8	1.0
08/19/2023	23	51	19.241	-02	19	11.31	29.0376871	29.9071177	2.35	7.8	1.0
08/20/2023	23	51	14.283	-02	19	45.51	29.0291871	29.9070934	2.35	7.8	1.0
08/21/2023	23	51	09.257	-02	20	20.11	29.0209423	29.9070690	2.35	7.8	1.0
08/22/2023	23	51	04.168	-02	20	55.08	29.0129552	29.9070446	2.35	7.8	0.9
08/23/2023	23	50	59.016	-02	21	30.41	29.0052285	29.9070202	2.35	7.8	0.9
08/24/2023	23	50	53.807	-02	22	06.07	28.9977644	29.9069957	2.35	7.8	0.9
08/25/2023	23	50	48.541	-02	22	42.04	28.9905651	29.9069713	2.36	7.8	0.8
08/26/2023	23	50	43.221	-02	23	18.33	28.9836328	29.9069469	2.36	7.8	0.8
08/27/2023	23	50	37.847	-02	23	54.91	28.9769693	29.9069224	2.36	7.8	0.8
08/28/2023	23	50	32.420	-02	24	31.80	28.9705765	29.9068980	2.36	7.8	0.7
08/29/2023	23	50	26.940	-02	25	08.98	28.9644560	29.9068735	2.36	7.8	0.7
08/30/2023	23	50	21.406	-02	25	46.47	28.9586097	29.9068490	2.36	7.8	0.7
08/31/2023	23	50	15.819	-02	26	24.25	28.9530390	29.9068246	2.36	7.8	0.6
09/01/2023	23	50	10.184	-02	27	02.29	28.9477457	29.9068001	2.36	7.8	0.6
09/02/2023	23	50	04.503	-02	27	40.58	28.9427315	29.9067756	2.36	7.8	0.6
09/03/2023	23	49	58.781	-02	28	19.09	28.9379983	29.9067511	2.36	7.8	0.6
09/04/2023	23	49	53.021	-02	28	57.78	28.9335479	29.9067266	2.36	7.8	0.5
09/05/2023	23	49	47.228	-02	29	36.65	28.9293821	29.9067020	2.36	7.8	0.5
09/06/2023	23	49	41.402	-02	30	15.67	28.9255029	29.9066775	2.36	7.8	0.5

## Neptune - Apparent data

Date 0 h TT	Right Ascension			Declination			Earth	Solar	Equatorial	Mag.	Phase Angle deg.
	h	m	s	d	m	s	Distance au	Distance au	Diameter arc sec		
09/07/2023	23	49	35.545	-02	30	54.85	28.9219120	29.9066530	2.36	7.8	0.4
09/08/2023	23	49	29.657	-02	31	34.18	28.9186111	29.9066284	2.36	7.8	0.4
09/09/2023	23	49	23.741	-02	32	13.65	28.9156018	29.9066039	2.36	7.8	0.4
09/10/2023	23	49	17.797	-02	32	53.24	28.9128855	29.9065793	2.36	7.8	0.3
09/11/2023	23	49	11.827	-02	33	32.96	28.9104637	29.9065547	2.36	7.8	0.3
09/12/2023	23	49	05.833	-02	34	12.78	28.9083376	29.9065301	2.36	7.8	0.3
09/13/2023	23	48	59.816	-02	34	52.70	28.9065083	29.9065055	2.36	7.8	0.2
09/14/2023	23	48	53.780	-02	35	32.69	28.9049768	29.9064809	2.36	7.8	0.2
09/15/2023	23	48	47.728	-02	36	12.73	28.9037438	29.9064563	2.36	7.8	0.2
09/16/2023	23	48	41.662	-02	36	52.81	28.9028103	29.9064317	2.36	7.8	0.1
09/17/2023	23	48	35.586	-02	37	32.89	28.9021765	29.9064071	2.36	7.8	0.1
09/18/2023	23	48	29.504	-02	38	12.96	28.9018430	29.9063824	2.36	7.8	0.1
09/19/2023	23	48	23.420	-02	38	52.99	28.9018100	29.9063578	2.36	7.8	0.0
09/20/2023	23	48	17.337	-02	39	32.97	28.9020775	29.9063331	2.36	7.8	0.0
09/21/2023	23	48	11.257	-02	40	12.86	28.9026454	29.9063085	2.36	7.8	0.1
09/22/2023	23	48	05.182	-02	40	52.67	28.9035135	29.9062838	2.36	7.8	0.1
09/23/2023	23	47	59.115	-02	41	32.38	28.9046814	29.9062591	2.36	7.8	0.1
09/24/2023	23	47	53.056	-02	42	11.98	28.9061486	29.9062344	2.36	7.8	0.2
09/25/2023	23	47	47.006	-02	42	51.47	28.9079145	29.9062097	2.36	7.8	0.2
09/26/2023	23	47	40.965	-02	43	30.85	28.9099782	29.9061850	2.36	7.8	0.2
09/27/2023	23	47	34.934	-02	44	10.11	28.9123391	29.9061603	2.36	7.8	0.3
09/28/2023	23	47	28.915	-02	44	49.23	28.9149963	29.9061356	2.36	7.8	0.3
09/29/2023	23	47	22.913	-02	45	28.20	28.9179491	29.9061109	2.36	7.8	0.3
09/30/2023	23	47	16.931	-02	46	06.97	28.9211967	29.9060861	2.36	7.8	0.3
10/01/2023	23	47	10.974	-02	46	45.53	28.9247385	29.9060614	2.36	7.8	0.4
10/02/2023	23	47	05.046	-02	47	23.84	28.9285737	29.9060366	2.36	7.8	0.4
10/03/2023	23	46	59.150	-02	48	01.91	28.9327018	29.9060119	2.36	7.8	0.4
10/04/2023	23	46	53.286	-02	48	39.71	28.9371221	29.9059871	2.36	7.8	0.5
10/05/2023	23	46	47.455	-02	49	17.24	28.9418336	29.9059623	2.36	7.8	0.5
10/06/2023	23	46	41.660	-02	49	54.49	28.9468356	29.9059376	2.36	7.8	0.5
10/07/2023	23	46	35.901	-02	50	31.46	28.9521270	29.9059128	2.36	7.8	0.6
10/08/2023	23	46	30.179	-02	51	08.14	28.9577066	29.9058880	2.36	7.8	0.6
10/09/2023	23	46	24.496	-02	51	44.52	28.9635731	29.9058632	2.36	7.8	0.6
10/10/2023	23	46	18.855	-02	52	20.58	28.9697251	29.9058384	2.36	7.8	0.7
10/11/2023	23	46	13.257	-02	52	56.31	28.9761611	29.9058136	2.36	7.8	0.7
10/12/2023	23	46	07.706	-02	53	31.69	28.9828794	29.9057887	2.36	7.8	0.7
10/13/2023	23	46	02.204	-02	54	06.69	28.9898780	29.9057639	2.36	7.8	0.8
10/14/2023	23	45	56.756	-02	54	41.30	28.9971550	29.9057391	2.36	7.8	0.8
10/15/2023	23	45	51.364	-02	55	15.49	29.0047083	29.9057142	2.35	7.8	0.8
10/16/2023	23	45	46.033	-02	55	49.24	29.0125355	29.9056894	2.35	7.8	0.9
10/17/2023	23	45	40.764	-02	56	22.54	29.0206341	29.9056645	2.35	7.8	0.9
10/18/2023	23	45	35.562	-02	56	55.36	29.0290015	29.9056396	2.35	7.8	0.9
10/19/2023	23	45	30.427	-02	57	27.69	29.0376350	29.9056148	2.35	7.8	1.0
10/20/2023	23	45	25.361	-02	57	59.53	29.0465316	29.9055899	2.35	7.8	1.0
10/21/2023	23	45	20.366	-02	58	30.88	29.0556883	29.9055650	2.35	7.8	1.0
10/22/2023	23	45	15.440	-02	59	01.72	29.0651019	29.9055401	2.35	7.8	1.0
10/23/2023	23	45	10.585	-02	59	32.07	29.0747692	29.9055152	2.35	7.8	1.1
10/24/2023	23	45	05.801	-03	00	01.91	29.0846870	29.9054903	2.35	7.8	1.1
10/25/2023	23	45	01.089	-03	00	31.23	29.0948520	29.9054654	2.35	7.8	1.1
10/26/2023	23	44	56.454	-03	01	00.02	29.1052608	29.9054404	2.35	7.8	1.1

## Neptune - Apparent data

Date 0 h TT	Right Ascension			Declination			Earth	Solar	Equatorial	Mag.	Phase Angle deg.
	h	m	s	d	m	s	Distance au	Distance au	Diameter arc sec		
10/27/2023	23	44	51.897	-03	01	28.25	29.1159104	29.9054155	2.35	7.8	1.2
10/28/2023	23	44	47.422	-03	01	55.91	29.1267974	29.9053906	2.34	7.8	1.2
10/29/2023	23	44	43.035	-03	02	22.96	29.1379188	29.9053656	2.34	7.8	1.2
10/30/2023	23	44	38.736	-03	02	49.40	29.1492714	29.9053407	2.34	7.8	1.2
10/31/2023	23	44	34.527	-03	03	15.21	29.1608522	29.9053157	2.34	7.8	1.3
11/01/2023	23	44	30.410	-03	03	40.39	29.1726578	29.9052908	2.34	7.8	1.3
11/02/2023	23	44	26.384	-03	04	04.95	29.1846852	29.9052658	2.34	7.8	1.3
11/03/2023	23	44	22.449	-03	04	28.89	29.1969310	29.9052408	2.34	7.8	1.3
11/04/2023	23	44	18.607	-03	04	52.19	29.2093917	29.9052159	2.34	7.8	1.4
11/05/2023	23	44	14.858	-03	05	14.85	29.2220638	29.9051909	2.34	7.8	1.4
11/06/2023	23	44	11.203	-03	05	36.88	29.2349436	29.9051659	2.34	7.8	1.4
11/07/2023	23	44	07.644	-03	05	58.24	29.2480273	29.9051409	2.33	7.8	1.4
11/08/2023	23	44	04.183	-03	06	18.94	29.2613110	29.9051159	2.33	7.8	1.5
11/09/2023	23	44	00.823	-03	06	38.95	29.2747907	29.9050909	2.33	7.8	1.5
11/10/2023	23	43	57.566	-03	06	58.26	29.2884623	29.9050659	2.33	7.8	1.5
11/11/2023	23	43	54.414	-03	07	16.86	29.3023214	29.9050408	2.33	7.8	1.5
11/12/2023	23	43	51.371	-03	07	34.73	29.3163638	29.9050158	2.33	7.8	1.5
11/13/2023	23	43	48.438	-03	07	51.84	29.3305848	29.9049908	2.33	7.8	1.6
11/14/2023	23	43	45.619	-03	08	08.20	29.3449799	29.9049658	2.33	7.8	1.6
11/15/2023	23	43	42.913	-03	08	23.79	29.3595442	29.9049407	2.33	7.8	1.6
11/16/2023	23	43	40.322	-03	08	38.61	29.3742729	29.9049157	2.32	7.8	1.6
11/17/2023	23	43	37.846	-03	08	52.67	29.3891610	29.9048906	2.32	7.8	1.6
11/18/2023	23	43	35.483	-03	09	05.97	29.4042035	29.9048655	2.32	7.9	1.6
11/19/2023	23	43	33.234	-03	09	18.51	29.4193952	29.9048405	2.32	7.9	1.7
11/20/2023	23	43	31.097	-03	09	30.30	29.4347312	29.9048154	2.32	7.9	1.7
11/21/2023	23	43	29.073	-03	09	41.33	29.4502062	29.9047903	2.32	7.9	1.7
11/22/2023	23	43	27.165	-03	09	51.60	29.4658153	29.9047653	2.32	7.9	1.7
11/23/2023	23	43	25.373	-03	10	01.08	29.4815536	29.9047402	2.32	7.9	1.7
11/24/2023	23	43	23.701	-03	10	09.77	29.4974161	29.9047151	2.32	7.9	1.7
11/25/2023	23	43	22.151	-03	10	17.65	29.5133981	29.9046900	2.31	7.9	1.7
11/26/2023	23	43	20.726	-03	10	24.70	29.5294948	29.9046649	2.31	7.9	1.8
11/27/2023	23	43	19.425	-03	10	30.93	29.5457014	29.9046398	2.31	7.9	1.8
11/28/2023	23	43	18.250	-03	10	36.34	29.5620133	29.9046147	2.31	7.9	1.8
11/29/2023	23	43	17.198	-03	10	40.93	29.5784259	29.9045895	2.31	7.9	1.8
11/30/2023	23	43	16.271	-03	10	44.70	29.5949343	29.9045644	2.31	7.9	1.8
12/01/2023	23	43	15.466	-03	10	47.68	29.6115338	29.9045393	2.31	7.9	1.8
12/02/2023	23	43	14.783	-03	10	49.85	29.6282195	29.9045142	2.30	7.9	1.8
12/03/2023	23	43	14.223	-03	10	51.23	29.6449865	29.9044890	2.30	7.9	1.8
12/04/2023	23	43	13.785	-03	10	51.79	29.6618298	29.9044639	2.30	7.9	1.8
12/05/2023	23	43	13.471	-03	10	51.55	29.6787444	29.9044387	2.30	7.9	1.8
12/06/2023	23	43	13.282	-03	10	50.49	29.6957250	29.9044136	2.30	7.9	1.8
12/07/2023	23	43	13.219	-03	10	48.61	29.7127664	29.9043884	2.30	7.9	1.9
12/08/2023	23	43	13.284	-03	10	45.89	29.7298634	29.9043633	2.30	7.9	1.9
12/09/2023	23	43	13.477	-03	10	42.33	29.7470107	29.9043381	2.30	7.9	1.9
12/10/2023	23	43	13.801	-03	10	37.92	29.7642027	29.9043129	2.29	7.9	1.9
12/11/2023	23	43	14.257	-03	10	32.65	29.7814339	29.9042878	2.29	7.9	1.9
12/12/2023	23	43	14.845	-03	10	26.52	29.7986989	29.9042626	2.29	7.9	1.9
12/13/2023	23	43	15.564	-03	10	19.54	29.8159918	29.9042374	2.29	7.9	1.9
12/14/2023	23	43	16.415	-03	10	11.71	29.8333070	29.9042122	2.29	7.9	1.9
12/15/2023	23	43	17.394	-03	10	03.05	29.8506387	29.9041870	2.29	7.9	1.9

Neptune - Apparent data

Date	Right Ascension	Declination	Earth Distance	Solar Distance	Equatorial Diameter	Mag.	Phase Angle
0 h TT	h m s	d m s	au	au	arc sec		deg.
12/16/2023	23 43 18.500	-03 09 53.57	29.8679812	29.9041618	2.29	7.9	1.9
12/17/2023	23 43 19.730	-03 09 43.29	29.8853287	29.9041366	2.29	7.9	1.9
12/18/2023	23 43 21.085	-03 09 32.20	29.9026755	29.9041114	2.28	7.9	1.9
12/19/2023	23 43 22.563	-03 09 20.31	29.9200162	29.9040862	2.28	7.9	1.9
12/20/2023	23 43 24.168	-03 09 07.61	29.9373453	29.9040610	2.28	7.9	1.9
12/21/2023	23 43 25.898	-03 08 54.09	29.9546575	29.9040358	2.28	7.9	1.9
12/22/2023	23 43 27.757	-03 08 39.75	29.9719477	29.9040105	2.28	7.9	1.9
12/23/2023	23 43 29.745	-03 08 24.58	29.9892107	29.9039853	2.28	7.9	1.9
12/24/2023	23 43 31.862	-03 08 08.57	30.0064416	29.9039601	2.28	7.9	1.9
12/25/2023	23 43 34.107	-03 07 51.75	30.0236355	29.9039349	2.27	7.9	1.9
12/26/2023	23 43 36.478	-03 07 34.12	30.0407874	29.9039096	2.27	7.9	1.9
12/27/2023	23 43 38.975	-03 07 15.70	30.0578926	29.9038844	2.27	7.9	1.8
12/28/2023	23 43 41.594	-03 06 56.49	30.0749462	29.9038591	2.27	7.9	1.8
12/29/2023	23 43 44.334	-03 06 36.52	30.0919434	29.9038339	2.27	7.9	1.8
12/30/2023	23 43 47.193	-03 06 15.78	30.1088793	29.9038086	2.27	7.9	1.8
12/31/2023	23 43 50.172	-03 05 54.29	30.1257491	29.9037834	2.27	7.9	1.8
01/01/2024	23 43 53.270	-03 05 32.04	30.1425478	29.9037581	2.27	7.9	1.8
01/02/2024	23 43 56.486	-03 05 09.03	30.1592705	29.9037329	2.26	7.9	1.8



Pluto - Apparent data

Date 0 h TT	Earth			Solar	Equatorial	Mag.	Phase Angle deg.
	Right Ascension	Declination	Distance	Distance	Diameter		
	h m s	d m s	au	au	arc sec		
12/31/2022	20 00 44.015	-22 50 27.48	35.6078360	34.6766670	0.09	14.5	0.5
01/01/2023	20 00 52.098	-22 50 08.59	35.6138177	34.6773366	0.09	14.5	0.5
01/02/2023	20 01 00.219	-22 49 49.63	35.6195183	34.6780062	0.09	14.5	0.4
01/03/2023	20 01 08.375	-22 49 30.61	35.6249367	34.6786758	0.09	14.5	0.4
01/04/2023	20 01 16.566	-22 49 11.53	35.6300718	34.6793454	0.09	14.5	0.4
01/05/2023	20 01 24.788	-22 48 52.42	35.6349225	34.6800150	0.09	14.5	0.4
01/06/2023	20 01 33.038	-22 48 33.29	35.6394879	34.6806846	0.09	14.5	0.3
01/07/2023	20 01 41.313	-22 48 14.14	35.6437669	34.6813543	0.09	14.5	0.3
01/08/2023	20 01 49.611	-22 47 54.99	35.6477588	34.6820240	0.09	14.5	0.3
01/09/2023	20 01 57.928	-22 47 35.83	35.6514625	34.6826936	0.09	14.5	0.3
01/10/2023	20 02 06.263	-22 47 16.67	35.6548772	34.6833633	0.09	14.5	0.2
01/11/2023	20 02 14.612	-22 46 57.50	35.6580020	34.6840330	0.09	14.5	0.2
01/12/2023	20 02 22.975	-22 46 38.33	35.6608362	34.6847028	0.09	14.5	0.2
01/13/2023	20 02 31.350	-22 46 19.16	35.6633789	34.6853725	0.09	14.5	0.2
01/14/2023	20 02 39.737	-22 45 59.97	35.6656295	34.6860423	0.09	14.5	0.1
01/15/2023	20 02 48.135	-22 45 40.78	35.6675871	34.6867120	0.09	14.5	0.1
01/16/2023	20 02 56.543	-22 45 21.58	35.6692513	34.6873818	0.09	14.5	0.1
01/17/2023	20 03 04.961	-22 45 02.38	35.6706214	34.6880516	0.09	14.5	0.1
01/18/2023	20 03 13.388	-22 44 43.20	35.6716969	34.6887215	0.09	14.5	0.1
01/19/2023	20 03 21.822	-22 44 24.06	35.6724772	34.6893913	0.09	14.5	0.1
01/20/2023	20 03 30.259	-22 44 04.97	35.6729622	34.6900611	0.09	14.5	0.1
01/21/2023	20 03 38.696	-22 43 45.95	35.6731516	34.6907310	0.09	14.5	0.1
01/22/2023	20 03 47.126	-22 43 27.02	35.6730454	34.6914009	0.09	14.5	0.1
01/23/2023	20 03 55.545	-22 43 08.19	35.6726440	34.6920708	0.09	14.5	0.2
01/24/2023	20 04 03.949	-22 42 49.43	35.6719478	34.6927407	0.09	14.5	0.2
01/25/2023	20 04 12.338	-22 42 30.74	35.6709576	34.6934106	0.09	14.5	0.2
01/26/2023	20 04 20.711	-22 42 12.12	35.6696743	34.6940805	0.09	14.5	0.2
01/27/2023	20 04 29.069	-22 41 53.56	35.6680989	34.6947505	0.09	14.5	0.3
01/28/2023	20 04 37.411	-22 41 35.07	35.6662325	34.6954205	0.09	14.5	0.3
01/29/2023	20 04 45.737	-22 41 16.65	35.6640765	34.6960905	0.09	14.5	0.3
01/30/2023	20 04 54.046	-22 40 58.33	35.6616319	34.6967605	0.09	14.5	0.3
01/31/2023	20 05 02.334	-22 40 40.12	35.6589002	34.6974305	0.09	14.5	0.4
02/01/2023	20 05 10.600	-22 40 22.02	35.6558826	34.6981005	0.09	14.5	0.4
02/02/2023	20 05 18.840	-22 40 04.06	35.6525805	34.6987705	0.09	14.5	0.4
02/03/2023	20 05 27.052	-22 39 46.25	35.6489953	34.6994406	0.09	14.5	0.4
02/04/2023	20 05 35.233	-22 39 28.58	35.6451284	34.7001107	0.09	14.5	0.5
02/05/2023	20 05 43.380	-22 39 11.07	35.6409813	34.7007808	0.09	14.5	0.5
02/06/2023	20 05 51.490	-22 38 53.72	35.6365554	34.7014509	0.09	14.5	0.5
02/07/2023	20 05 59.561	-22 38 36.52	35.6318523	34.7021210	0.09	14.5	0.5
02/08/2023	20 06 07.593	-22 38 19.48	35.6268734	34.7027911	0.09	14.5	0.6
02/09/2023	20 06 15.583	-22 38 02.59	35.6216203	34.7034613	0.09	14.5	0.6
02/10/2023	20 06 23.532	-22 37 45.85	35.6160947	34.7041315	0.09	14.5	0.6
02/11/2023	20 06 31.437	-22 37 29.27	35.6102981	34.7048017	0.09	14.5	0.6
02/12/2023	20 06 39.300	-22 37 12.83	35.6042321	34.7054719	0.09	14.5	0.7
02/13/2023	20 06 47.120	-22 36 56.56	35.5978985	34.7061421	0.09	14.5	0.7
02/14/2023	20 06 54.895	-22 36 40.46	35.5912991	34.7068123	0.09	14.5	0.7
02/15/2023	20 07 02.625	-22 36 24.54	35.5844357	34.7074825	0.09	14.5	0.8
02/16/2023	20 07 10.307	-22 36 08.83	35.5773101	34.7081528	0.09	14.5	0.8
02/17/2023	20 07 17.937	-22 35 53.34	35.5699245	34.7088231	0.09	14.5	0.8
02/18/2023	20 07 25.510	-22 35 38.08	35.5622811	34.7094934	0.09	14.5	0.8

Pluto - Apparent data

Date 0 h TT	Earth			Solar	Equatorial	Mag.	Phase Angle deg.
	Right Ascension h m s	Declination d m s	Distance au	Distance au	Diameter arc sec		
02/19/2023	20 07 33.023	-22 35 23.07	35.5543823	34.7101637	0.09	14.5	0.9
02/20/2023	20 07 40.471	-22 35 08.31	35.5462306	34.7108340	0.09	14.5	0.9
02/21/2023	20 07 47.851	-22 34 53.77	35.5378289	34.7115044	0.09	14.5	0.9
02/22/2023	20 07 55.165	-22 34 39.46	35.5291802	34.7121747	0.09	14.5	0.9
02/23/2023	20 08 02.412	-22 34 25.36	35.5202876	34.7128451	0.09	14.5	0.9
02/24/2023	20 08 09.593	-22 34 11.47	35.5111546	34.7135155	0.09	14.5	1.0
02/25/2023	20 08 16.708	-22 33 57.81	35.5017843	34.7141859	0.09	14.5	1.0
02/26/2023	20 08 23.757	-22 33 44.39	35.4921803	34.7148563	0.09	14.5	1.0
02/27/2023	20 08 30.737	-22 33 31.21	35.4823459	34.7155267	0.09	14.5	1.0
02/28/2023	20 08 37.646	-22 33 18.31	35.4722845	34.7161972	0.09	14.5	1.1
03/01/2023	20 08 44.481	-22 33 05.67	35.4619996	34.7168677	0.09	14.5	1.1
03/02/2023	20 08 51.241	-22 32 53.33	35.4514945	34.7175382	0.09	14.5	1.1
03/03/2023	20 08 57.923	-22 32 41.28	35.4407727	34.7182087	0.09	14.5	1.1
03/04/2023	20 09 04.523	-22 32 29.53	35.4298376	34.7188792	0.09	14.5	1.1
03/05/2023	20 09 11.041	-22 32 18.07	35.4186928	34.7195497	0.09	14.5	1.2
03/06/2023	20 09 17.474	-22 32 06.91	35.4073415	34.7202203	0.09	14.5	1.2
03/07/2023	20 09 23.822	-22 31 56.05	35.3957873	34.7208908	0.09	14.5	1.2
03/08/2023	20 09 30.082	-22 31 45.47	35.3840336	34.7215614	0.09	14.5	1.2
03/09/2023	20 09 36.256	-22 31 35.19	35.3720839	34.7222320	0.09	14.5	1.2
03/10/2023	20 09 42.343	-22 31 25.18	35.3599416	34.7229026	0.09	14.5	1.3
03/11/2023	20 09 48.342	-22 31 15.47	35.3476102	34.7235732	0.09	14.5	1.3
03/12/2023	20 09 54.255	-22 31 06.04	35.3350932	34.7242439	0.09	14.5	1.3
03/13/2023	20 10 00.081	-22 30 56.90	35.3223940	34.7249145	0.09	14.5	1.3
03/14/2023	20 10 05.819	-22 30 48.08	35.3095164	34.7255852	0.09	14.5	1.3
03/15/2023	20 10 11.467	-22 30 39.58	35.2964638	34.7262559	0.09	14.5	1.3
03/16/2023	20 10 17.023	-22 30 31.43	35.2832401	34.7269266	0.09	14.5	1.4
03/17/2023	20 10 22.482	-22 30 23.62	35.2698490	34.7275974	0.09	14.5	1.4
03/18/2023	20 10 27.842	-22 30 16.18	35.2562946	34.7282681	0.09	14.5	1.4
03/19/2023	20 10 33.098	-22 30 09.10	35.2425810	34.7289389	0.09	14.5	1.4
03/20/2023	20 10 38.250	-22 30 02.37	35.2287125	34.7296096	0.09	14.5	1.4
03/21/2023	20 10 43.295	-22 29 55.98	35.2146936	34.7302804	0.09	14.5	1.4
03/22/2023	20 10 48.235	-22 29 49.92	35.2005288	34.7309512	0.09	14.5	1.5
03/23/2023	20 10 53.071	-22 29 44.19	35.1862231	34.7316221	0.09	14.5	1.5
03/24/2023	20 10 57.804	-22 29 38.78	35.1717810	34.7322929	0.09	14.5	1.5
03/25/2023	20 11 02.435	-22 29 33.70	35.1572075	34.7329638	0.09	14.5	1.5
03/26/2023	20 11 06.962	-22 29 28.98	35.1425075	34.7336346	0.09	14.5	1.5
03/27/2023	20 11 11.385	-22 29 24.61	35.1276856	34.7343055	0.09	14.5	1.5
03/28/2023	20 11 15.700	-22 29 20.62	35.1127468	34.7349764	0.09	14.5	1.5
03/29/2023	20 11 19.907	-22 29 17.01	35.0976957	34.7356473	0.09	14.5	1.5
03/30/2023	20 11 24.004	-22 29 13.79	35.0825370	34.7363183	0.09	14.5	1.6
03/31/2023	20 11 27.988	-22 29 10.95	35.0672754	34.7369892	0.09	14.5	1.6
04/01/2023	20 11 31.858	-22 29 08.50	35.0519156	34.7376602	0.09	14.5	1.6
04/02/2023	20 11 35.612	-22 29 06.43	35.0364622	34.7383312	0.09	14.5	1.6
04/03/2023	20 11 39.252	-22 29 04.74	35.0209198	34.7390022	0.09	14.5	1.6
04/04/2023	20 11 42.775	-22 29 03.43	35.0052929	34.7396732	0.09	14.5	1.6
04/05/2023	20 11 46.183	-22 29 02.47	34.9895861	34.7403443	0.09	14.5	1.6
04/06/2023	20 11 49.476	-22 29 01.88	34.9738038	34.7410153	0.09	14.5	1.6
04/07/2023	20 11 52.654	-22 29 01.64	34.9579506	34.7416864	0.09	14.5	1.6
04/08/2023	20 11 55.720	-22 29 01.76	34.9420309	34.7423575	0.09	14.5	1.6
04/09/2023	20 11 58.673	-22 29 02.24	34.9260490	34.7430286	0.09	14.5	1.6

Pluto - Apparent data

Date 0 h TT	Right Ascension			Declination			Earth Distance au	Solar Distance au	Equatorial Diameter arc sec	Mag.	Phase Angle deg.
	h	m	s	d	m	s					
04/10/2023	20	12	01.514	-22	29	03.09	34.9100096	34.7436997	0.09	14.5	1.6
04/11/2023	20	12	04.241	-22	29	04.32	34.8939170	34.7443709	0.09	14.5	1.6
04/12/2023	20	12	06.853	-22	29	05.94	34.8777757	34.7450420	0.09	14.5	1.6
04/13/2023	20	12	09.346	-22	29	07.97	34.8615905	34.7457132	0.09	14.5	1.7
04/14/2023	20	12	11.720	-22	29	10.41	34.8453660	34.7463844	0.09	14.5	1.7
04/15/2023	20	12	13.970	-22	29	13.26	34.8291070	34.7470556	0.09	14.5	1.7
04/16/2023	20	12	16.095	-22	29	16.51	34.8128186	34.7477268	0.09	14.5	1.7
04/17/2023	20	12	18.095	-22	29	20.15	34.7965057	34.7483981	0.09	14.5	1.7
04/18/2023	20	12	19.972	-22	29	24.16	34.7801735	34.7490693	0.09	14.5	1.7
04/19/2023	20	12	21.726	-22	29	28.53	34.7638274	34.7497406	0.09	14.5	1.7
04/20/2023	20	12	23.360	-22	29	33.26	34.7474726	34.7504119	0.09	14.5	1.7
04/21/2023	20	12	24.875	-22	29	38.35	34.7311145	34.7510832	0.09	14.5	1.7
04/22/2023	20	12	26.273	-22	29	43.81	34.7147584	34.7517545	0.09	14.5	1.7
04/23/2023	20	12	27.551	-22	29	49.65	34.6984096	34.7524258	0.09	14.5	1.7
04/24/2023	20	12	28.711	-22	29	55.87	34.6820732	34.7530972	0.09	14.5	1.7
04/25/2023	20	12	29.749	-22	30	02.50	34.6657545	34.7537686	0.09	14.5	1.7
04/26/2023	20	12	30.666	-22	30	09.52	34.6494584	34.7544399	0.09	14.5	1.7
04/27/2023	20	12	31.460	-22	30	16.93	34.6331900	34.7551113	0.09	14.5	1.7
04/28/2023	20	12	32.131	-22	30	24.75	34.6169543	34.7557828	0.09	14.5	1.7
04/29/2023	20	12	32.677	-22	30	32.95	34.6007559	34.7564542	0.09	14.5	1.7
04/30/2023	20	12	33.100	-22	30	41.53	34.5845998	34.7571256	0.09	14.5	1.7
05/01/2023	20	12	33.399	-22	30	50.48	34.5684907	34.7577971	0.09	14.5	1.6
05/02/2023	20	12	33.577	-22	30	59.79	34.5524332	34.7584686	0.09	14.4	1.6
05/03/2023	20	12	33.633	-22	31	09.45	34.5364319	34.7591401	0.09	14.4	1.6
05/04/2023	20	12	33.571	-22	31	19.45	34.5204914	34.7598116	0.09	14.4	1.6
05/05/2023	20	12	33.391	-22	31	29.80	34.5046161	34.7604831	0.09	14.4	1.6
05/06/2023	20	12	33.096	-22	31	40.47	34.4888103	34.7611546	0.10	14.4	1.6
05/07/2023	20	12	32.687	-22	31	51.49	34.4730785	34.7618262	0.10	14.4	1.6
05/08/2023	20	12	32.164	-22	32	02.86	34.4574250	34.7624978	0.10	14.4	1.6
05/09/2023	20	12	31.526	-22	32	14.59	34.4418542	34.7631693	0.10	14.4	1.6
05/10/2023	20	12	30.772	-22	32	26.68	34.4263705	34.7638409	0.10	14.4	1.6
05/11/2023	20	12	29.900	-22	32	39.15	34.4109783	34.7645126	0.10	14.4	1.6
05/12/2023	20	12	28.907	-22	32	51.99	34.3956823	34.7651842	0.10	14.4	1.6
05/13/2023	20	12	27.794	-22	33	05.19	34.3804870	34.7658558	0.10	14.4	1.6
05/14/2023	20	12	26.560	-22	33	18.73	34.3653973	34.7665275	0.10	14.4	1.6
05/15/2023	20	12	25.207	-22	33	32.59	34.3504178	34.7671992	0.10	14.4	1.5
05/16/2023	20	12	23.738	-22	33	46.77	34.3355535	34.7678708	0.10	14.4	1.5
05/17/2023	20	12	22.156	-22	34	01.24	34.3208092	34.7685425	0.10	14.4	1.5
05/18/2023	20	12	20.463	-22	34	16.02	34.3061898	34.7692143	0.10	14.4	1.5
05/19/2023	20	12	18.661	-22	34	31.09	34.2917001	34.7698860	0.10	14.4	1.5
05/20/2023	20	12	16.750	-22	34	46.47	34.2773448	34.7705577	0.10	14.4	1.5
05/21/2023	20	12	14.732	-22	35	02.16	34.2631287	34.7712295	0.10	14.4	1.5
05/22/2023	20	12	12.605	-22	35	18.17	34.2490562	34.7719013	0.10	14.4	1.5
05/23/2023	20	12	10.370	-22	35	34.50	34.2351318	34.7725730	0.10	14.4	1.4
05/24/2023	20	12	08.026	-22	35	51.15	34.2213599	34.7732448	0.10	14.4	1.4
05/25/2023	20	12	05.574	-22	36	08.10	34.2077447	34.7739167	0.10	14.4	1.4
05/26/2023	20	12	03.014	-22	36	25.36	34.1942904	34.7745885	0.10	14.4	1.4
05/27/2023	20	12	00.346	-22	36	42.91	34.1810009	34.7752603	0.10	14.4	1.4
05/28/2023	20	11	57.573	-22	37	00.73	34.1678803	34.7759322	0.10	14.4	1.4
05/29/2023	20	11	54.695	-22	37	18.82	34.1549323	34.7766041	0.10	14.4	1.3

## Pluto - Apparent data

Date 0 h TT	Right Ascension			Declination			Earth Distance au	Solar Distance au	Equatorial Diameter arc sec	Mag.	Phase Angle deg.
	h	m	s	d	m	s					
05/30/2023	20	11	51.716	-22	37	37.17	34.1421607	34.7772759	0.10	14.4	1.3
05/31/2023	20	11	48.637	-22	37	55.75	34.1295692	34.7779478	0.10	14.4	1.3
06/01/2023	20	11	45.462	-22	38	14.57	34.1171612	34.7786198	0.10	14.4	1.3
06/02/2023	20	11	42.193	-22	38	33.61	34.1049403	34.7792917	0.10	14.4	1.3
06/03/2023	20	11	38.833	-22	38	52.87	34.0929097	34.7799636	0.10	14.4	1.3
06/04/2023	20	11	35.384	-22	39	12.36	34.0810729	34.7806356	0.10	14.4	1.2
06/05/2023	20	11	31.845	-22	39	32.09	34.0694329	34.7813075	0.10	14.4	1.2
06/06/2023	20	11	28.217	-22	39	52.07	34.0579932	34.7819795	0.10	14.4	1.2
06/07/2023	20	11	24.497	-22	40	12.29	34.0467569	34.7826515	0.10	14.4	1.2
06/08/2023	20	11	20.685	-22	40	32.76	34.0357276	34.7833235	0.10	14.4	1.2
06/09/2023	20	11	16.781	-22	40	53.46	34.0249085	34.7839955	0.10	14.4	1.1
06/10/2023	20	11	12.785	-22	41	14.37	34.0143032	34.7846676	0.10	14.4	1.1
06/11/2023	20	11	08.699	-22	41	35.47	34.0039153	34.7853396	0.10	14.4	1.1
06/12/2023	20	11	04.528	-22	41	56.75	33.9937483	34.7860117	0.10	14.4	1.1
06/13/2023	20	11	00.275	-22	42	18.19	33.9838056	34.7866837	0.10	14.4	1.1
06/14/2023	20	10	55.943	-22	42	39.78	33.9740910	34.7873558	0.10	14.4	1.0
06/15/2023	20	10	51.535	-22	43	01.53	33.9646076	34.7880279	0.10	14.4	1.0
06/16/2023	20	10	47.053	-22	43	23.44	33.9553590	34.7887000	0.10	14.4	1.0
06/17/2023	20	10	42.498	-22	43	45.50	33.9463484	34.7893722	0.10	14.4	1.0
06/18/2023	20	10	37.871	-22	44	07.73	33.9375788	34.7900443	0.10	14.4	0.9
06/19/2023	20	10	33.173	-22	44	30.12	33.9290532	34.7907164	0.10	14.4	0.9
06/20/2023	20	10	28.404	-22	44	52.67	33.9207745	34.7913886	0.10	14.4	0.9
06/21/2023	20	10	23.565	-22	45	15.37	33.9127455	34.7920608	0.10	14.4	0.9
06/22/2023	20	10	18.657	-22	45	38.21	33.9049686	34.7927330	0.10	14.4	0.8
06/23/2023	20	10	13.682	-22	46	01.18	33.8974464	34.7934052	0.10	14.4	0.8
06/24/2023	20	10	08.641	-22	46	24.27	33.8901812	34.7940774	0.10	14.4	0.8
06/25/2023	20	10	03.537	-22	46	47.46	33.8831751	34.7947496	0.10	14.4	0.8
06/26/2023	20	09	58.373	-22	47	10.74	33.8764303	34.7954218	0.10	14.4	0.7
06/27/2023	20	09	53.152	-22	47	34.09	33.8699487	34.7960941	0.10	14.4	0.7
06/28/2023	20	09	47.878	-22	47	57.50	33.8637321	34.7967664	0.10	14.4	0.7
06/29/2023	20	09	42.553	-22	48	20.96	33.8577823	34.7974386	0.10	14.4	0.7
06/30/2023	20	09	37.181	-22	48	44.47	33.8521009	34.7981109	0.10	14.4	0.6
07/01/2023	20	09	31.765	-22	49	08.02	33.8466893	34.7987832	0.10	14.4	0.6
07/02/2023	20	09	26.307	-22	49	31.63	33.8415491	34.7994555	0.10	14.4	0.6
07/03/2023	20	09	20.808	-22	49	55.30	33.8366816	34.8001279	0.10	14.4	0.6
07/04/2023	20	09	15.266	-22	50	19.04	33.8320882	34.8008002	0.10	14.4	0.5
07/05/2023	20	09	09.681	-22	50	42.84	33.8277704	34.8014726	0.10	14.4	0.5
07/06/2023	20	09	04.052	-22	51	06.70	33.8237295	34.8021449	0.10	14.4	0.5
07/07/2023	20	08	58.380	-22	51	30.59	33.8199671	34.8028173	0.10	14.4	0.4
07/08/2023	20	08	52.668	-22	51	54.49	33.8164848	34.8034897	0.10	14.4	0.4
07/09/2023	20	08	46.920	-22	52	18.38	33.8132843	34.8041621	0.10	14.4	0.4
07/10/2023	20	08	41.141	-22	52	42.25	33.8103670	34.8048345	0.10	14.4	0.4
07/11/2023	20	08	35.334	-22	53	06.08	33.8077345	34.8055070	0.10	14.4	0.3
07/12/2023	20	08	29.502	-22	53	29.88	33.8053883	34.8061794	0.10	14.4	0.3
07/13/2023	20	08	23.649	-22	53	53.65	33.8033295	34.8068519	0.10	14.4	0.3
07/14/2023	20	08	17.777	-22	54	17.38	33.8015595	34.8075243	0.10	14.4	0.3
07/15/2023	20	08	11.886	-22	54	41.09	33.8000792	34.8081968	0.10	14.4	0.2
07/16/2023	20	08	05.978	-22	55	04.77	33.7988896	34.8088693	0.10	14.4	0.2
07/17/2023	20	08	00.054	-22	55	28.42	33.7979914	34.8095418	0.10	14.4	0.2
07/18/2023	20	07	54.115	-22	55	52.03	33.7973852	34.8102143	0.10	14.4	0.2

Pluto - Apparent data

Date 0 h TT	Earth			Solar	Equatorial	Mag.	Phase Angle deg.
	Right Ascension	Declination	Distance	Distance	Diameter		
	h m s	d m s	au	au	arc sec		
07/19/2023	20 07 48.163	-22 56 15.59	33.7970715	34.8108869	0.10	14.4	0.1
07/20/2023	20 07 42.198	-22 56 39.09	33.7970507	34.8115594	0.10	14.4	0.1
07/21/2023	20 07 36.224	-22 57 02.53	33.7973228	34.8122320	0.10	14.4	0.1
07/22/2023	20 07 30.244	-22 57 25.87	33.7978880	34.8129045	0.10	14.4	0.1
07/23/2023	20 07 24.259	-22 57 49.11	33.7987461	34.8135771	0.10	14.4	0.1
07/24/2023	20 07 18.274	-22 58 12.24	33.7998970	34.8142497	0.10	14.4	0.1
07/25/2023	20 07 12.292	-22 58 35.24	33.8013402	34.8149223	0.10	14.4	0.1
07/26/2023	20 07 06.317	-22 58 58.11	33.8030754	34.8155949	0.10	14.4	0.1
07/27/2023	20 07 00.353	-22 59 20.84	33.8051018	34.8162676	0.10	14.4	0.2
07/28/2023	20 06 54.401	-22 59 43.42	33.8074190	34.8169402	0.10	14.4	0.2
07/29/2023	20 06 48.466	-23 00 05.86	33.8100259	34.8176129	0.10	14.4	0.2
07/30/2023	20 06 42.549	-23 00 28.17	33.8129219	34.8182855	0.10	14.4	0.2
07/31/2023	20 06 36.649	-23 00 50.36	33.8161059	34.8189582	0.10	14.4	0.3
08/01/2023	20 06 30.766	-23 01 12.42	33.8195772	34.8196309	0.10	14.4	0.3
08/02/2023	20 06 24.899	-23 01 34.36	33.8233347	34.8203036	0.10	14.4	0.3
08/03/2023	20 06 19.049	-23 01 56.15	33.8273779	34.8209763	0.10	14.4	0.3
08/04/2023	20 06 13.217	-23 02 17.78	33.8317058	34.8216490	0.10	14.4	0.4
08/05/2023	20 06 07.407	-23 02 39.22	33.8363179	34.8223218	0.10	14.4	0.4
08/06/2023	20 06 01.624	-23 03 00.46	33.8412134	34.8229945	0.10	14.4	0.4
08/07/2023	20 05 55.872	-23 03 21.48	33.8463915	34.8236673	0.10	14.4	0.4
08/08/2023	20 05 50.155	-23 03 42.29	33.8518516	34.8243401	0.10	14.4	0.5
08/09/2023	20 05 44.476	-23 04 02.89	33.8575925	34.8250129	0.10	14.4	0.5
08/10/2023	20 05 38.836	-23 04 23.27	33.8636133	34.8256857	0.10	14.4	0.5
08/11/2023	20 05 33.238	-23 04 43.46	33.8699127	34.8263585	0.10	14.4	0.5
08/12/2023	20 05 27.683	-23 05 03.45	33.8764893	34.8270313	0.10	14.4	0.6
08/13/2023	20 05 22.170	-23 05 23.23	33.8833417	34.8277041	0.10	14.4	0.6
08/14/2023	20 05 16.701	-23 05 42.80	33.8904682	34.8283770	0.10	14.4	0.6
08/15/2023	20 05 11.278	-23 06 02.17	33.8978669	34.8290498	0.10	14.4	0.7
08/16/2023	20 05 05.903	-23 06 21.30	33.9055360	34.8297227	0.10	14.4	0.7
08/17/2023	20 05 00.576	-23 06 40.21	33.9134734	34.8303956	0.10	14.4	0.7
08/18/2023	20 04 55.300	-23 06 58.86	33.9216768	34.8310685	0.10	14.4	0.7
08/19/2023	20 04 50.078	-23 07 17.26	33.9301440	34.8317414	0.10	14.4	0.8
08/20/2023	20 04 44.914	-23 07 35.38	33.9388725	34.8324143	0.10	14.4	0.8
08/21/2023	20 04 39.810	-23 07 53.23	33.9478596	34.8330873	0.10	14.4	0.8
08/22/2023	20 04 34.770	-23 08 10.78	33.9571028	34.8337602	0.10	14.4	0.8
08/23/2023	20 04 29.797	-23 08 28.04	33.9665992	34.8344332	0.10	14.4	0.9
08/24/2023	20 04 24.894	-23 08 45.01	33.9763460	34.8351062	0.10	14.4	0.9
08/25/2023	20 04 20.063	-23 09 01.69	33.9863401	34.8357792	0.10	14.4	0.9
08/26/2023	20 04 15.306	-23 09 18.09	33.9965787	34.8364522	0.10	14.4	0.9
08/27/2023	20 04 10.623	-23 09 34.21	34.0070584	34.8371252	0.10	14.4	0.9
08/28/2023	20 04 06.013	-23 09 50.06	34.0177765	34.8377982	0.10	14.4	1.0
08/29/2023	20 04 01.477	-23 10 05.65	34.0287296	34.8384712	0.10	14.4	1.0
08/30/2023	20 03 57.012	-23 10 20.96	34.0399149	34.8391443	0.10	14.4	1.0
08/31/2023	20 03 52.620	-23 10 35.99	34.0513294	34.8398174	0.10	14.4	1.0
09/01/2023	20 03 48.302	-23 10 50.70	34.0629702	34.8404904	0.10	14.4	1.1
09/02/2023	20 03 44.064	-23 11 05.07	34.0748345	34.8411635	0.10	14.4	1.1
09/03/2023	20 03 39.908	-23 11 19.11	34.0869196	34.8418366	0.10	14.4	1.1
09/04/2023	20 03 35.839	-23 11 32.80	34.0992225	34.8425097	0.10	14.4	1.1
09/05/2023	20 03 31.860	-23 11 46.15	34.1117404	34.8431829	0.10	14.4	1.1
09/06/2023	20 03 27.972	-23 11 59.17	34.1244701	34.8438560	0.10	14.4	1.2

## Pluto - Apparent data

Date 0 h TT	Right Ascension			Declination			Earth	Solar	Equatorial	Mag.	Phase Angle deg.
	h	m	s	d	m	s	Distance au	Distance au	Diameter arc sec		
09/07/2023	20	03	24.177	-23	12	11.88	34.1374085	34.8445292	0.10	14.4	1.2
09/08/2023	20	03	20.473	-23	12	24.26	34.1505522	34.8452024	0.10	14.4	1.2
09/09/2023	20	03	16.863	-23	12	36.34	34.1638978	34.8458755	0.10	14.4	1.2
09/10/2023	20	03	13.345	-23	12	48.10	34.1774416	34.8465487	0.10	14.4	1.2
09/11/2023	20	03	09.921	-23	12	59.53	34.1911800	34.8472220	0.10	14.4	1.3
09/12/2023	20	03	06.591	-23	13	10.65	34.2051091	34.8478952	0.10	14.4	1.3
09/13/2023	20	03	03.358	-23	13	21.43	34.2192250	34.8485684	0.10	14.4	1.3
09/14/2023	20	03	00.221	-23	13	31.86	34.2335237	34.8492417	0.10	14.4	1.3
09/15/2023	20	02	57.184	-23	13	41.94	34.2480009	34.8499149	0.10	14.4	1.3
09/16/2023	20	02	54.248	-23	13	51.66	34.2626524	34.8505882	0.10	14.4	1.3
09/17/2023	20	02	51.416	-23	14	01.01	34.2774739	34.8512615	0.10	14.4	1.4
09/18/2023	20	02	48.691	-23	14	09.99	34.2924609	34.8519348	0.10	14.4	1.4
09/19/2023	20	02	46.075	-23	14	18.58	34.3076089	34.8526082	0.10	14.4	1.4
09/20/2023	20	02	43.571	-23	14	26.80	34.3229133	34.8532815	0.10	14.4	1.4
09/21/2023	20	02	41.179	-23	14	34.66	34.3383695	34.8539549	0.10	14.4	1.4
09/22/2023	20	02	38.900	-23	14	42.15	34.3539728	34.8546282	0.10	14.4	1.4
09/23/2023	20	02	36.736	-23	14	49.29	34.3697186	34.8553016	0.10	14.4	1.4
09/24/2023	20	02	34.684	-23	14	56.09	34.3856021	34.8559750	0.10	14.4	1.5
09/25/2023	20	02	32.743	-23	15	02.55	34.4016187	34.8566485	0.10	14.4	1.5
09/26/2023	20	02	30.913	-23	15	08.67	34.4177638	34.8573219	0.10	14.4	1.5
09/27/2023	20	02	29.191	-23	15	14.45	34.4340329	34.8579953	0.10	14.4	1.5
09/28/2023	20	02	27.579	-23	15	19.86	34.4504217	34.8586688	0.10	14.4	1.5
09/29/2023	20	02	26.079	-23	15	24.89	34.4669257	34.8593423	0.10	14.5	1.5
09/30/2023	20	02	24.694	-23	15	29.52	34.4835407	34.8600158	0.10	14.5	1.5
10/01/2023	20	02	23.428	-23	15	33.76	34.5002625	34.8606893	0.09	14.5	1.5
10/02/2023	20	02	22.283	-23	15	37.60	34.5170869	34.8613628	0.09	14.5	1.5
10/03/2023	20	02	21.259	-23	15	41.07	34.5340093	34.8620364	0.09	14.5	1.5
10/04/2023	20	02	20.359	-23	15	44.17	34.5510256	34.8627099	0.09	14.5	1.6
10/05/2023	20	02	19.579	-23	15	46.91	34.5681310	34.8633835	0.09	14.5	1.6
10/06/2023	20	02	18.921	-23	15	49.30	34.5853210	34.8640571	0.09	14.5	1.6
10/07/2023	20	02	18.382	-23	15	51.35	34.6025908	34.8647307	0.09	14.5	1.6
10/08/2023	20	02	17.964	-23	15	53.04	34.6199356	34.8654043	0.09	14.5	1.6
10/09/2023	20	02	17.664	-23	15	54.39	34.6373503	34.8660780	0.09	14.5	1.6
10/10/2023	20	02	17.484	-23	15	55.37	34.6548301	34.8667516	0.09	14.5	1.6
10/11/2023	20	02	17.424	-23	15	56.00	34.6723699	34.8674253	0.09	14.5	1.6
10/12/2023	20	02	17.485	-23	15	56.25	34.6899644	34.8680990	0.09	14.5	1.6
10/13/2023	20	02	17.668	-23	15	56.12	34.7076085	34.8687727	0.09	14.5	1.6
10/14/2023	20	02	17.975	-23	15	55.61	34.7252969	34.8694465	0.09	14.5	1.6
10/15/2023	20	02	18.407	-23	15	54.71	34.7430242	34.8701202	0.09	14.5	1.6
10/16/2023	20	02	18.966	-23	15	53.42	34.7607852	34.8707940	0.09	14.5	1.6
10/17/2023	20	02	19.653	-23	15	51.75	34.7785744	34.8714677	0.09	14.5	1.6
10/18/2023	20	02	20.469	-23	15	49.71	34.7963863	34.8721415	0.09	14.5	1.6
10/19/2023	20	02	21.413	-23	15	47.30	34.8142156	34.8728153	0.09	14.5	1.6
10/20/2023	20	02	22.485	-23	15	44.54	34.8320569	34.8734892	0.09	14.5	1.6
10/21/2023	20	02	23.683	-23	15	41.45	34.8499048	34.8741630	0.09	14.5	1.6
10/22/2023	20	02	25.005	-23	15	38.01	34.8677541	34.8748369	0.09	14.5	1.6
10/23/2023	20	02	26.448	-23	15	34.25	34.8855996	34.8755108	0.09	14.5	1.6
10/24/2023	20	02	28.011	-23	15	30.16	34.9034362	34.8761847	0.09	14.5	1.6
10/25/2023	20	02	29.692	-23	15	25.72	34.9212590	34.8768586	0.09	14.5	1.6
10/26/2023	20	02	31.493	-23	15	20.92	34.9390630	34.8775325	0.09	14.5	1.6

Pluto - Apparent data

Date 0 h TT	Right Ascension			Declination			Earth Distance au	Solar Distance au	Equatorial Diameter arc sec	Mag.	Phase Angle deg.
	h	m	s	d	m	s					
10/27/2023	20	02	33.415	-23	15	15.76	34.9568436	34.8782065	0.09	14.5	1.6
10/28/2023	20	02	35.460	-23	15	10.22	34.9745960	34.8788804	0.09	14.5	1.6
10/29/2023	20	02	37.631	-23	15	04.30	34.9923158	34.8795544	0.09	14.5	1.6
10/30/2023	20	02	39.927	-23	14	58.03	35.0099981	34.8802284	0.09	14.5	1.6
10/31/2023	20	02	42.348	-23	14	51.42	35.0276385	34.8809024	0.09	14.5	1.6
11/01/2023	20	02	44.894	-23	14	44.48	35.0452321	34.8815765	0.09	14.5	1.6
11/02/2023	20	02	47.562	-23	14	37.22	35.0627742	34.8822505	0.09	14.5	1.6
11/03/2023	20	02	50.350	-23	14	29.65	35.0802600	34.8829246	0.09	14.5	1.6
11/04/2023	20	02	53.257	-23	14	21.77	35.0976845	34.8835987	0.09	14.5	1.6
11/05/2023	20	02	56.280	-23	14	13.58	35.1150428	34.8842728	0.09	14.5	1.6
11/06/2023	20	02	59.420	-23	14	05.08	35.1323298	34.8849469	0.09	14.5	1.6
11/07/2023	20	03	02.675	-23	13	56.27	35.1495406	34.8856211	0.09	14.5	1.6
11/08/2023	20	03	06.045	-23	13	47.14	35.1666701	34.8862952	0.09	14.5	1.5
11/09/2023	20	03	09.531	-23	13	37.68	35.1837131	34.8869694	0.09	14.5	1.5
11/10/2023	20	03	13.133	-23	13	27.89	35.2006646	34.8876436	0.09	14.5	1.5
11/11/2023	20	03	16.851	-23	13	17.77	35.2175195	34.8883178	0.09	14.5	1.5
11/12/2023	20	03	20.686	-23	13	07.33	35.2342726	34.8889921	0.09	14.5	1.5
11/13/2023	20	03	24.639	-23	12	56.55	35.2509189	34.8896663	0.09	14.5	1.5
11/14/2023	20	03	28.710	-23	12	45.47	35.2674531	34.8903406	0.09	14.5	1.5
11/15/2023	20	03	32.897	-23	12	34.08	35.2838703	34.8910149	0.09	14.5	1.5
11/16/2023	20	03	37.199	-23	12	22.40	35.3001655	34.8916892	0.09	14.5	1.5
11/17/2023	20	03	41.613	-23	12	10.45	35.3163337	34.8923635	0.09	14.5	1.4
11/18/2023	20	03	46.137	-23	11	58.24	35.3323701	34.8930379	0.09	14.5	1.4
11/19/2023	20	03	50.766	-23	11	45.77	35.3482700	34.8937122	0.09	14.5	1.4
11/20/2023	20	03	55.498	-23	11	33.05	35.3640289	34.8943866	0.09	14.5	1.4
11/21/2023	20	04	00.331	-23	11	20.06	35.3796425	34.8950610	0.09	14.5	1.4
11/22/2023	20	04	05.264	-23	11	06.79	35.3951065	34.8957355	0.09	14.5	1.4
11/23/2023	20	04	10.299	-23	10	53.25	35.4104168	34.8964099	0.09	14.5	1.4
11/24/2023	20	04	15.435	-23	10	39.41	35.4255695	34.8970844	0.09	14.5	1.3
11/25/2023	20	04	20.674	-23	10	25.29	35.4405606	34.8977588	0.09	14.5	1.3
11/26/2023	20	04	26.016	-23	10	10.90	35.4553863	34.8984333	0.09	14.5	1.3
11/27/2023	20	04	31.461	-23	09	56.25	35.4700428	34.8991079	0.09	14.5	1.3
11/28/2023	20	04	37.006	-23	09	41.35	35.4845263	34.8997824	0.09	14.5	1.3
11/29/2023	20	04	42.649	-23	09	26.22	35.4988331	34.9004570	0.09	14.5	1.3
11/30/2023	20	04	48.388	-23	09	10.88	35.5129592	34.9011315	0.09	14.5	1.2
12/01/2023	20	04	54.218	-23	08	55.33	35.5269008	34.9018061	0.09	14.5	1.2
12/02/2023	20	05	00.138	-23	08	39.58	35.5406541	34.9024807	0.09	14.5	1.2
12/03/2023	20	05	06.146	-23	08	23.61	35.5542150	34.9031554	0.09	14.5	1.2
12/04/2023	20	05	12.240	-23	08	07.44	35.5675798	34.9038300	0.09	14.5	1.2
12/05/2023	20	05	18.420	-23	07	51.05	35.5807445	34.9045047	0.09	14.5	1.2
12/06/2023	20	05	24.684	-23	07	34.44	35.5937052	34.9051794	0.09	14.5	1.1
12/07/2023	20	05	31.032	-23	07	17.62	35.6064581	34.9058541	0.09	14.5	1.1
12/08/2023	20	05	37.464	-23	07	00.58	35.6189994	34.9065288	0.09	14.5	1.1
12/09/2023	20	05	43.980	-23	06	43.32	35.6313252	34.9072036	0.09	14.5	1.1
12/10/2023	20	05	50.579	-23	06	25.85	35.6434318	34.9078783	0.09	14.5	1.1
12/11/2023	20	05	57.261	-23	06	08.18	35.6553155	34.9085531	0.09	14.5	1.0
12/12/2023	20	06	04.025	-23	05	50.31	35.6669726	34.9092279	0.09	14.5	1.0
12/13/2023	20	06	10.869	-23	05	32.27	35.6783995	34.9099027	0.09	14.5	1.0
12/14/2023	20	06	17.790	-23	05	14.08	35.6895926	34.9105776	0.09	14.5	1.0
12/15/2023	20	06	24.783	-23	04	55.74	35.7005488	34.9112525	0.09	14.5	0.9

Pluto - Apparent data

Date 0 h TT	Right Ascension			Declination			Earth	Solar	Equatorial	Mag.	Phase Angle deg.
	h	m	s	d	m	s	Distance au	Distance au	Diameter arc sec		
12/16/2023	20	06	31.844	-23	04	37.28	35.7112647	34.9119273	0.09	14.5	0.9
12/17/2023	20	06	38.970	-23	04	18.68	35.7217375	34.9126022	0.09	14.5	0.9
12/18/2023	20	06	46.158	-23	03	59.95	35.7319643	34.9132772	0.09	14.5	0.9
12/19/2023	20	06	53.406	-23	03	41.08	35.7419424	34.9139521	0.09	14.5	0.8
12/20/2023	20	07	00.715	-23	03	22.05	35.7516695	34.9146271	0.09	14.5	0.8
12/21/2023	20	07	08.084	-23	03	02.87	35.7611433	34.9153021	0.09	14.5	0.8
12/22/2023	20	07	15.514	-23	02	43.54	35.7703616	34.9159771	0.09	14.5	0.8
12/23/2023	20	07	23.004	-23	02	24.07	35.7793222	34.9166521	0.09	14.5	0.7
12/24/2023	20	07	30.554	-23	02	04.47	35.7880232	34.9173271	0.09	14.5	0.7
12/25/2023	20	07	38.161	-23	01	44.75	35.7964625	34.9180022	0.09	14.5	0.7
12/26/2023	20	07	45.823	-23	01	24.95	35.8046383	34.9186773	0.09	14.5	0.7
12/27/2023	20	07	53.536	-23	01	05.06	35.8125485	34.9193524	0.09	14.5	0.7
12/28/2023	20	08	01.298	-23	00	45.11	35.8201912	34.9200275	0.09	14.5	0.6
12/29/2023	20	08	09.104	-23	00	25.09	35.8275644	34.9207027	0.09	14.5	0.6
12/30/2023	20	08	16.953	-23	00	05.00	35.8346663	34.9213778	0.09	14.5	0.6
12/31/2023	20	08	24.841	-22	59	44.86	35.8414950	34.9220530	0.09	14.5	0.6
01/01/2024	20	08	32.768	-22	59	24.65	35.8480484	34.9227282	0.09	14.5	0.5
01/02/2024	20	08	40.732	-22	59	04.37	35.8543249	34.9234034	0.09	14.5	0.5



Table of percent illumination versus phase angle.

Phase	%Illum.	Phase
0.00000	100.0	360.00000
5.00000	99.8	355.00000
10.00000	99.2	350.00000
15.00000	98.3	345.00000
20.00000	97.0	340.00000
25.00000	95.3	335.00000
30.00000	93.3	330.00000
35.00000	91.0	325.00000
36.86990	90.0	323.13010
40.00000	88.3	320.00000
45.00000	85.4	315.00000
45.57300	85.0	314.42700
50.00000	82.1	310.00000
53.13010	80.0	306.86990
55.00000	78.7	305.00000
60.00000	75.0	300.00000
65.00000	71.1	295.00000
66.42182	70.0	293.57818
70.00000	67.1	290.00000
72.54240	65.0	287.45760
75.00000	62.9	285.00000
78.46304	60.0	281.53696
80.00000	58.7	280.00000
84.26083	55.0	275.73917
85.00000	54.4	275.00000
90.00000	50.0	270.00000
95.00000	45.6	265.00000
95.73917	45.0	264.26083
100.00000	41.3	260.00000
101.53696	40.0	258.46304
105.00000	37.1	255.00000
107.45760	35.0	252.54240
110.00000	32.9	250.00000
113.57818	30.0	246.42182
115.00000	28.9	245.00000
120.00000	25.0	240.00000
125.00000	21.3	235.00000
126.86990	20.0	233.13010
130.00000	17.9	230.00000
134.42700	15.0	225.57300
135.00000	14.6	225.00000
140.00000	11.7	220.00000
143.13010	10.0	216.86990
145.00000	9.0	215.00000
150.00000	6.7	210.00000
155.00000	4.7	205.00000
160.00000	3.0	200.00000
165.00000	1.7	195.00000
170.00000	0.8	190.00000
175.00000	0.2	185.00000
180.00000	0.0	180.00000