

Sun - Apparent data

Date	Right Ascension	Declination	Distance	Diameter
0 h TT	h m s	d m s	au	arc sec
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
01/03/2024	18 52 30.293	-22 53 23.05	0.9833070	1951.85
01/04/2024	18 56 54.538	-22 47 38.11	0.9833095	1951.85
01/05/2024	19 01 18.419	-22 41 25.97	0.9833171	1951.83
01/06/2024	19 05 41.908	-22 34 46.78	0.9833297	1951.81
01/07/2024	19 10 04.975	-22 27 40.74	0.9833469	1951.77
01/08/2024	19 14 27.594	-22 20 08.06	0.9833685	1951.73
01/09/2024	19 18 49.735	-22 12 08.96	0.9833942	1951.68
01/10/2024	19 23 11.368	-22 03 43.67	0.9834238	1951.62
01/11/2024	19 27 32.462	-21 54 52.46	0.9834570	1951.55
01/12/2024	19 31 52.985	-21 45 35.58	0.9834939	1951.48
01/13/2024	19 36 12.907	-21 35 53.32	0.9835342	1951.40
01/14/2024	19 40 32.199	-21 25 45.95	0.9835781	1951.31
01/15/2024	19 44 50.835	-21 15 13.77	0.9836258	1951.22
01/16/2024	19 49 08.793	-21 04 17.09	0.9836774	1951.12
01/17/2024	19 53 26.054	-20 52 56.21	0.9837333	1951.00
01/18/2024	19 57 42.603	-20 41 11.48	0.9837938	1950.88
01/19/2024	20 01 58.425	-20 29 03.23	0.9838592	1950.76
01/20/2024	20 06 13.505	-20 16 31.81	0.9839297	1950.62
01/21/2024	20 10 27.834	-20 03 37.58	0.9840058	1950.46
01/22/2024	20 14 41.398	-19 50 20.91	0.9840875	1950.30
01/23/2024	20 18 54.190	-19 36 42.13	0.9841750	1950.13
01/24/2024	20 23 06.200	-19 22 41.63	0.9842685	1949.94
01/25/2024	20 27 17.422	-19 08 19.75	0.9843679	1949.75
01/26/2024	20 31 27.850	-18 53 36.85	0.9844734	1949.54
01/27/2024	20 35 37.480	-18 38 33.29	0.9845848	1949.32
01/28/2024	20 39 46.310	-18 23 09.44	0.9847021	1949.09
01/29/2024	20 43 54.338	-18 07 25.64	0.9848252	1948.84
01/30/2024	20 48 01.563	-17 51 22.28	0.9849538	1948.59
01/31/2024	20 52 07.988	-17 34 59.72	0.9850879	1948.32
02/01/2024	20 56 13.612	-17 18 18.34	0.9852272	1948.05
02/02/2024	21 00 18.438	-17 01 18.52	0.9853714	1947.76
02/03/2024	21 04 22.468	-16 44 00.65	0.9855203	1947.47
02/04/2024	21 08 25.705	-16 26 25.13	0.9856736	1947.16
02/05/2024	21 12 28.151	-16 08 32.36	0.9858310	1946.85
02/06/2024	21 16 29.808	-15 50 22.75	0.9859921	1946.54
02/07/2024	21 20 30.678	-15 31 56.72	0.9861566	1946.21
02/08/2024	21 24 30.760	-15 13 14.70	0.9863242	1945.88
02/09/2024	21 28 30.055	-14 54 17.14	0.9864945	1945.54
02/10/2024	21 32 28.561	-14 35 04.47	0.9866674	1945.20
02/11/2024	21 36 26.280	-14 15 37.14	0.9868427	1944.86
02/12/2024	21 40 23.216	-13 55 55.56	0.9870204	1944.51
02/13/2024	21 44 19.375	-13 36 00.20	0.9872007	1944.15
02/14/2024	21 48 14.766	-13 15 51.47	0.9873836	1943.79
02/15/2024	21 52 09.399	-12 55 29.83	0.9875695	1943.43
02/16/2024	21 56 03.284	-12 34 55.70	0.9877586	1943.05
02/17/2024	21 59 56.434	-12 14 09.53	0.9879511	1942.68
02/18/2024	22 03 48.860	-11 53 11.74	0.9881475	1942.29

Sun - Apparent data

Date	Right Ascension	Declination	Distance	Diameter
0 h TT	h m s	d m s	au	arc sec
02/19/2024	22 07 40.576	-11 32 02.76	0.9883477	1941.90
02/20/2024	22 11 31.595	-11 10 43.00	0.9885521	1941.49
02/21/2024	22 15 21.935	-10 49 12.87	0.9887607	1941.09
02/22/2024	22 19 11.610	-10 27 32.76	0.9889736	1940.67
02/23/2024	22 23 00.638	-10 05 43.07	0.9891910	1940.24
02/24/2024	22 26 49.038	-09 43 44.19	0.9894127	1939.81
02/25/2024	22 30 36.829	-09 21 36.49	0.9896388	1939.36
02/26/2024	22 34 24.030	-08 59 20.36	0.9898692	1938.91
02/27/2024	22 38 10.664	-08 36 56.16	0.9901037	1938.45
02/28/2024	22 41 56.749	-08 14 24.28	0.9903423	1937.99
02/29/2024	22 45 42.309	-07 51 45.08	0.9905847	1937.51
03/01/2024	22 49 27.362	-07 28 58.93	0.9908307	1937.03
03/02/2024	22 53 11.931	-07 06 06.22	0.9910801	1936.54
03/03/2024	22 56 56.035	-06 43 07.32	0.9913325	1936.05
03/04/2024	23 00 39.695	-06 20 02.61	0.9915877	1935.55
03/05/2024	23 04 22.927	-05 56 52.48	0.9918453	1935.05
03/06/2024	23 08 05.750	-05 33 37.33	0.9921048	1934.54
03/07/2024	23 11 48.181	-05 10 17.56	0.9923660	1934.03
03/08/2024	23 15 30.234	-04 46 53.58	0.9926283	1933.52
03/09/2024	23 19 11.924	-04 23 25.79	0.9928915	1933.01
03/10/2024	23 22 53.267	-03 59 54.61	0.9931552	1932.50
03/11/2024	23 26 34.280	-03 36 20.45	0.9934193	1931.98
03/12/2024	23 30 14.981	-03 12 43.72	0.9936837	1931.47
03/13/2024	23 33 55.386	-02 49 04.81	0.9939485	1930.95
03/14/2024	23 37 35.514	-02 25 24.14	0.9942137	1930.44
03/15/2024	23 41 15.384	-02 01 42.09	0.9944797	1929.92
03/16/2024	23 44 55.012	-01 37 59.08	0.9947466	1929.40
03/17/2024	23 48 34.418	-01 14 15.48	0.9950146	1928.88
03/18/2024	23 52 13.621	-00 50 31.69	0.9952840	1928.36
03/19/2024	23 55 52.639	-00 26 48.05	0.9955550	1927.84
03/20/2024	23 59 31.495	-00 03 04.95	0.9958277	1927.31
03/21/2024	00 03 10.211	00 20 37.27	0.9961023	1926.78
03/22/2024	00 06 48.807	00 44 18.27	0.9963788	1926.24
03/23/2024	00 10 27.307	01 07 57.69	0.9966573	1925.71
03/24/2024	00 14 05.736	01 31 35.22	0.9969378	1925.16
03/25/2024	00 17 44.115	01 55 10.51	0.9972203	1924.62
03/26/2024	00 21 22.470	02 18 43.24	0.9975048	1924.07
03/27/2024	00 25 00.825	02 42 13.09	0.9977912	1923.52
03/28/2024	00 28 39.202	03 05 39.73	0.9980794	1922.96
03/29/2024	00 32 17.626	03 29 02.84	0.9983691	1922.40
03/30/2024	00 35 56.120	03 52 22.09	0.9986603	1921.84
03/31/2024	00 39 34.704	04 15 37.16	0.9989525	1921.28
04/01/2024	00 43 13.399	04 38 47.70	0.9992456	1920.72
04/02/2024	00 46 52.226	05 01 53.38	0.9995391	1920.15
04/03/2024	00 50 31.202	05 24 53.85	0.9998328	1919.59
04/04/2024	00 54 10.346	05 47 48.74	1.0001262	1919.03
04/05/2024	00 57 49.673	06 10 37.71	1.0004189	1918.47
04/06/2024	01 01 29.201	06 33 20.37	1.0007104	1917.91
04/07/2024	01 05 08.945	06 55 56.37	1.0010004	1917.35
04/08/2024	01 08 48.921	07 18 25.32	1.0012886	1916.80

Sun - Apparent data

Date	Right Ascension	Declination	Distance	Diameter
0 h TT	h m s	d m s	au	arc sec
04/09/2024	01 12 29.144	07 40 46.86	1.0015747	1916.25
04/10/2024	01 16 09.630	08 03 00.63	1.0018587	1915.71
04/11/2024	01 19 50.392	08 25 06.25	1.0021405	1915.17
04/12/2024	01 23 31.441	08 47 03.36	1.0024204	1914.63
04/13/2024	01 27 12.790	09 08 51.58	1.0026984	1914.10
04/14/2024	01 30 54.450	09 30 30.56	1.0029748	1913.58
04/15/2024	01 34 36.435	09 51 59.95	1.0032497	1913.05
04/16/2024	01 38 18.757	10 13 19.40	1.0035235	1912.53
04/17/2024	01 42 01.432	10 34 28.57	1.0037961	1912.01
04/18/2024	01 45 44.474	10 55 27.13	1.0040679	1911.49
04/19/2024	01 49 27.900	11 16 14.77	1.0043389	1910.98
04/20/2024	01 53 11.724	11 36 51.16	1.0046093	1910.46
04/21/2024	01 56 55.963	11 57 15.98	1.0048792	1909.95
04/22/2024	02 00 40.633	12 17 28.95	1.0051486	1909.44
04/23/2024	02 04 25.750	12 37 29.74	1.0054176	1908.93
04/24/2024	02 08 11.329	12 57 18.07	1.0056861	1908.42
04/25/2024	02 11 57.386	13 16 53.63	1.0059542	1907.91
04/26/2024	02 15 43.934	13 36 16.12	1.0062218	1907.40
04/27/2024	02 19 30.989	13 55 25.25	1.0064887	1906.90
04/28/2024	02 23 18.560	14 14 20.72	1.0067547	1906.39
04/29/2024	02 27 06.661	14 33 02.22	1.0070197	1905.89
04/30/2024	02 30 55.299	14 51 29.43	1.0072832	1905.39
05/01/2024	02 34 44.484	15 09 42.04	1.0075451	1904.90
05/02/2024	02 38 34.224	15 27 39.72	1.0078048	1904.41
05/03/2024	02 42 24.524	15 45 22.14	1.0080621	1903.92
05/04/2024	02 46 15.392	16 02 48.97	1.0083164	1903.44
05/05/2024	02 50 06.832	16 19 59.87	1.0085674	1902.97
05/06/2024	02 53 58.849	16 36 54.53	1.0088148	1902.50
05/07/2024	02 57 51.444	16 53 32.60	1.0090581	1902.04
05/08/2024	03 01 44.618	17 09 53.78	1.0092972	1901.59
05/09/2024	03 05 38.368	17 25 57.75	1.0095321	1901.15
05/10/2024	03 09 32.690	17 41 44.18	1.0097626	1900.71
05/11/2024	03 13 27.579	17 57 12.76	1.0099889	1900.29
05/12/2024	03 17 23.028	18 12 23.17	1.0102112	1899.87
05/13/2024	03 21 19.033	18 27 15.12	1.0104296	1899.46
05/14/2024	03 25 15.590	18 41 48.30	1.0106443	1899.06
05/15/2024	03 29 12.694	18 56 02.43	1.0108555	1898.66
05/16/2024	03 33 10.343	19 09 57.23	1.0110634	1898.27
05/17/2024	03 37 08.533	19 23 32.45	1.0112682	1897.88
05/18/2024	03 41 07.261	19 36 47.81	1.0114701	1897.50
05/19/2024	03 45 06.524	19 49 43.07	1.0116692	1897.13
05/20/2024	03 49 06.319	20 02 17.99	1.0118656	1896.76
05/21/2024	03 53 06.642	20 14 32.34	1.0120595	1896.40
05/22/2024	03 57 07.487	20 26 25.90	1.0122510	1896.04
05/23/2024	04 01 08.851	20 37 58.43	1.0124402	1895.69
05/24/2024	04 05 10.728	20 49 09.74	1.0126271	1895.34
05/25/2024	04 09 13.110	20 59 59.61	1.0128116	1894.99
05/26/2024	04 13 15.989	21 10 27.83	1.0129937	1894.65
05/27/2024	04 17 19.356	21 20 34.20	1.0131733	1894.31
05/28/2024	04 21 23.200	21 30 18.49	1.0133502	1893.98

Sun - Apparent data

Date	Right Ascension	Declination	Distance	Diameter
0 h TT	h m s	d m s	au	arc sec
05/29/2024	04 25 27.510	21 39 40.51	1.0135240	1893.66
05/30/2024	04 29 32.275	21 48 40.04	1.0136944	1893.34
05/31/2024	04 33 37.481	21 57 16.87	1.0138612	1893.03
06/01/2024	04 37 43.115	22 05 30.79	1.0140238	1892.73
06/02/2024	04 41 49.162	22 13 21.61	1.0141819	1892.43
06/03/2024	04 45 55.606	22 20 49.15	1.0143352	1892.15
06/04/2024	04 50 02.429	22 27 53.25	1.0144833	1891.87
06/05/2024	04 54 09.608	22 34 33.74	1.0146259	1891.60
06/06/2024	04 58 17.120	22 40 50.47	1.0147629	1891.35
06/07/2024	05 02 24.938	22 46 43.31	1.0148942	1891.10
06/08/2024	05 06 33.035	22 52 12.11	1.0150197	1890.87
06/09/2024	05 10 41.385	22 57 16.75	1.0151396	1890.65
06/10/2024	05 14 49.961	23 01 57.12	1.0152540	1890.43
06/11/2024	05 18 58.738	23 06 13.09	1.0153630	1890.23
06/12/2024	05 23 07.692	23 10 04.59	1.0154669	1890.04
06/13/2024	05 27 16.799	23 13 31.53	1.0155658	1889.85
06/14/2024	05 31 26.037	23 16 33.84	1.0156600	1889.68
06/15/2024	05 35 35.384	23 19 11.46	1.0157496	1889.51
06/16/2024	05 39 44.818	23 21 24.37	1.0158348	1889.35
06/17/2024	05 43 54.317	23 23 12.52	1.0159159	1889.20
06/18/2024	05 48 03.861	23 24 35.90	1.0159931	1889.06
06/19/2024	05 52 13.429	23 25 34.50	1.0160666	1888.92
06/20/2024	05 56 23.000	23 26 08.32	1.0161365	1888.79
06/21/2024	06 00 32.553	23 26 17.39	1.0162030	1888.67
06/22/2024	06 04 42.067	23 26 01.72	1.0162662	1888.55
06/23/2024	06 08 51.523	23 25 21.34	1.0163262	1888.44
06/24/2024	06 13 00.898	23 24 16.26	1.0163829	1888.33
06/25/2024	06 17 10.173	23 22 46.52	1.0164362	1888.23
06/26/2024	06 21 19.327	23 20 52.14	1.0164861	1888.14
06/27/2024	06 25 28.342	23 18 33.15	1.0165321	1888.06
06/28/2024	06 29 37.198	23 15 49.59	1.0165741	1887.98
06/29/2024	06 33 45.877	23 12 41.52	1.0166116	1887.91
06/30/2024	06 37 54.359	23 09 08.99	1.0166444	1887.85
07/01/2024	06 42 02.623	23 05 12.10	1.0166720	1887.80
07/02/2024	06 46 10.647	23 00 50.95	1.0166941	1887.75
07/03/2024	06 50 18.406	22 56 05.64	1.0167105	1887.72
07/04/2024	06 54 25.874	22 50 56.32	1.0167210	1887.71
07/05/2024	06 58 33.025	22 45 23.10	1.0167254	1887.70
07/06/2024	07 02 39.834	22 39 26.15	1.0167236	1887.70
07/07/2024	07 06 46.274	22 33 05.59	1.0167157	1887.71
07/08/2024	07 10 52.322	22 26 21.60	1.0167017	1887.74
07/09/2024	07 14 57.956	22 19 14.34	1.0166817	1887.78
07/10/2024	07 19 03.156	22 11 43.98	1.0166559	1887.83
07/11/2024	07 23 07.903	22 03 50.70	1.0166245	1887.88
07/12/2024	07 27 12.180	21 55 34.70	1.0165877	1887.95
07/13/2024	07 31 15.973	21 46 56.18	1.0165456	1888.03
07/14/2024	07 35 19.267	21 37 55.34	1.0164986	1888.12
07/15/2024	07 39 22.050	21 28 32.40	1.0164469	1888.21
07/16/2024	07 43 24.309	21 18 47.60	1.0163907	1888.32
07/17/2024	07 47 26.033	21 08 41.16	1.0163303	1888.43

Sun - Apparent data

Date	Right Ascension	Declination	Distance	Diameter
0 h TT	h m s	d m s	au	arc sec
07/18/2024	07 51 27.214	20 58 13.31	1.0162659	1888.55
07/19/2024	07 55 27.841	20 47 24.30	1.0161979	1888.68
07/20/2024	07 59 27.908	20 36 14.37	1.0161264	1888.81
07/21/2024	08 03 27.407	20 24 43.76	1.0160517	1888.95
07/22/2024	08 07 26.332	20 12 52.71	1.0159738	1889.09
07/23/2024	08 11 24.680	20 00 41.44	1.0158929	1889.24
07/24/2024	08 15 22.448	19 48 10.18	1.0158089	1889.40
07/25/2024	08 19 19.636	19 35 19.14	1.0157216	1889.56
07/26/2024	08 23 16.244	19 22 08.56	1.0156308	1889.73
07/27/2024	08 27 12.273	19 08 38.68	1.0155362	1889.91
07/28/2024	08 31 07.723	18 54 49.73	1.0154375	1890.09
07/29/2024	08 35 02.593	18 40 42.01	1.0153345	1890.28
07/30/2024	08 38 56.880	18 26 15.78	1.0152267	1890.48
07/31/2024	08 42 50.580	18 11 31.33	1.0151139	1890.69
08/01/2024	08 46 43.688	17 56 28.98	1.0149959	1890.91
08/02/2024	08 50 36.200	17 41 09.01	1.0148726	1891.14
08/03/2024	08 54 28.111	17 25 31.74	1.0147438	1891.38
08/04/2024	08 58 19.419	17 09 37.47	1.0146094	1891.63
08/05/2024	09 02 10.122	16 53 26.52	1.0144696	1891.89
08/06/2024	09 06 00.220	16 36 59.19	1.0143242	1892.17
08/07/2024	09 09 49.713	16 20 15.80	1.0141736	1892.45
08/08/2024	09 13 38.606	16 03 16.67	1.0140177	1892.74
08/09/2024	09 17 26.901	15 46 02.11	1.0138568	1893.04
08/10/2024	09 21 14.603	15 28 32.44	1.0136910	1893.35
08/11/2024	09 25 01.720	15 10 47.98	1.0135207	1893.67
08/12/2024	09 28 48.259	14 52 49.05	1.0133461	1893.99
08/13/2024	09 32 34.226	14 34 35.99	1.0131675	1894.33
08/14/2024	09 36 19.630	14 16 09.10	1.0129850	1894.67
08/15/2024	09 40 04.482	13 57 28.73	1.0127992	1895.01
08/16/2024	09 43 48.790	13 38 35.19	1.0126102	1895.37
08/17/2024	09 47 32.566	13 19 28.79	1.0124185	1895.73
08/18/2024	09 51 15.821	13 00 09.86	1.0122243	1896.09
08/19/2024	09 54 58.568	12 40 38.69	1.0120279	1896.46
08/20/2024	09 58 40.823	12 20 55.56	1.0118295	1896.83
08/21/2024	10 02 22.601	12 01 00.76	1.0116293	1897.21
08/22/2024	10 06 03.924	11 40 54.56	1.0114272	1897.59
08/23/2024	10 09 44.810	11 20 37.20	1.0112230	1897.97
08/24/2024	10 13 25.280	11 00 08.99	1.0110167	1898.36
08/25/2024	10 17 05.351	10 39 30.20	1.0108080	1898.75
08/26/2024	10 20 45.040	10 18 41.15	1.0105965	1899.14
08/27/2024	10 24 24.360	09 57 42.15	1.0103820	1899.55
08/28/2024	10 28 03.326	09 36 33.54	1.0101643	1899.96
08/29/2024	10 31 41.948	09 15 15.64	1.0099431	1900.37
08/30/2024	10 35 20.240	08 53 48.80	1.0097182	1900.80
08/31/2024	10 38 58.214	08 32 13.36	1.0094895	1901.23
09/01/2024	10 42 35.883	08 10 29.65	1.0092569	1901.67
09/02/2024	10 46 13.261	07 48 38.01	1.0090204	1902.11
09/03/2024	10 49 50.362	07 26 38.80	1.0087799	1902.56
09/04/2024	10 53 27.202	07 04 32.35	1.0085356	1903.03
09/05/2024	10 57 03.797	06 42 18.99	1.0082876	1903.49

Sun - Apparent data

Date	Right Ascension	Declination	Distance	Diameter
0 h TT	h m s	d m s	au	arc sec
09/06/2024	11 00 40.162	06 19 59.08	1.0080359	1903.97
09/07/2024	11 04 16.315	05 57 32.95	1.0077807	1904.45
09/08/2024	11 07 52.273	05 35 00.95	1.0075223	1904.94
09/09/2024	11 11 28.053	05 12 23.43	1.0072609	1905.43
09/10/2024	11 15 03.672	04 49 40.71	1.0069968	1905.93
09/11/2024	11 18 39.148	04 26 53.16	1.0067302	1906.44
09/12/2024	11 22 14.500	04 04 01.10	1.0064615	1906.95
09/13/2024	11 25 49.744	03 41 04.89	1.0061910	1907.46
09/14/2024	11 29 24.900	03 18 04.86	1.0059191	1907.98
09/15/2024	11 32 59.986	02 55 01.34	1.0056462	1908.49
09/16/2024	11 36 35.024	02 31 54.64	1.0053727	1909.01
09/17/2024	11 40 10.036	02 08 45.09	1.0050989	1909.53
09/18/2024	11 43 45.047	01 45 32.97	1.0048251	1910.05
09/19/2024	11 47 20.084	01 22 18.55	1.0045514	1910.57
09/20/2024	11 50 55.176	00 59 02.12	1.0042779	1911.09
09/21/2024	11 54 30.348	00 35 43.96	1.0040044	1911.61
09/22/2024	11 58 05.627	00 12 24.37	1.0037309	1912.13
09/23/2024	12 01 41.033	-00 10 56.32	1.0034571	1912.66
09/24/2024	12 05 16.588	-00 34 17.79	1.0031828	1913.18
09/25/2024	12 08 52.312	-00 57 39.70	1.0029077	1913.70
09/26/2024	12 12 28.221	-01 21 01.67	1.0026315	1914.23
09/27/2024	12 16 04.336	-01 44 23.37	1.0023541	1914.76
09/28/2024	12 19 40.673	-02 07 44.41	1.0020754	1915.29
09/29/2024	12 23 17.253	-02 31 04.44	1.0017952	1915.83
09/30/2024	12 26 54.093	-02 54 23.09	1.0015134	1916.37
10/01/2024	12 30 31.212	-03 17 39.99	1.0012301	1916.91
10/02/2024	12 34 08.628	-03 40 54.77	1.0009451	1917.46
10/03/2024	12 37 46.361	-04 04 07.05	1.0006585	1918.01
10/04/2024	12 41 24.429	-04 27 16.47	1.0003704	1918.56
10/05/2024	12 45 02.849	-04 50 22.63	1.0000810	1919.11
10/06/2024	12 48 41.640	-05 13 25.17	0.9997903	1919.67
10/07/2024	12 52 20.820	-05 36 23.70	0.9994985	1920.23
10/08/2024	12 56 00.404	-05 59 17.84	0.9992060	1920.79
10/09/2024	12 59 40.410	-06 22 07.20	0.9989129	1921.36
10/10/2024	13 03 20.854	-06 44 51.40	0.9986195	1921.92
10/11/2024	13 07 01.753	-07 07 30.06	0.9983262	1922.49
10/12/2024	13 10 43.122	-07 30 02.78	0.9980334	1923.05
10/13/2024	13 14 24.980	-07 52 29.19	0.9977414	1923.61
10/14/2024	13 18 07.344	-08 14 48.92	0.9974508	1924.17
10/15/2024	13 21 50.235	-08 37 01.60	0.9971618	1924.73
10/16/2024	13 25 33.676	-08 59 06.88	0.9968749	1925.29
10/17/2024	13 29 17.690	-09 21 04.44	0.9965903	1925.84
10/18/2024	13 33 02.302	-09 42 53.93	0.9963083	1926.38
10/19/2024	13 36 47.536	-10 04 35.03	0.9960289	1926.92
10/20/2024	13 40 33.413	-10 26 07.40	0.9957521	1927.46
10/21/2024	13 44 19.951	-10 47 30.66	0.9954777	1927.99
10/22/2024	13 48 07.168	-11 08 44.45	0.9952056	1928.51
10/23/2024	13 51 55.078	-11 29 48.36	0.9949355	1929.04
10/24/2024	13 55 43.696	-11 50 42.00	0.9946672	1929.56
10/25/2024	13 59 33.036	-12 11 24.94	0.9944005	1930.08

Sun - Apparent data

Date	Right Ascension	Declination	Distance	Diameter
0 h TT	h m s	d m s	au	arc sec
10/26/2024	14 03 23.111	-12 31 56.79	0.9941353	1930.59
10/27/2024	14 07 13.933	-12 52 17.13	0.9938712	1931.10
10/28/2024	14 11 05.516	-13 12 25.54	0.9936084	1931.61
10/29/2024	14 14 57.869	-13 32 21.59	0.9933465	1932.12
10/30/2024	14 18 51.004	-13 52 04.88	0.9930856	1932.63
10/31/2024	14 22 44.929	-14 11 34.99	0.9928257	1933.14
11/01/2024	14 26 39.654	-14 30 51.48	0.9925667	1933.64
11/02/2024	14 30 35.185	-14 49 53.95	0.9923086	1934.15
11/03/2024	14 34 31.528	-15 08 41.97	0.9920515	1934.65
11/04/2024	14 38 28.687	-15 27 15.12	0.9917955	1935.15
11/05/2024	14 42 26.666	-15 45 32.97	0.9915409	1935.64
11/06/2024	14 46 25.466	-16 03 35.12	0.9912877	1936.14
11/07/2024	14 50 25.088	-16 21 21.12	0.9910362	1936.63
11/08/2024	14 54 25.534	-16 38 50.57	0.9907867	1937.12
11/09/2024	14 58 26.803	-16 56 03.05	0.9905396	1937.60
11/10/2024	15 02 28.895	-17 12 58.15	0.9902952	1938.08
11/11/2024	15 06 31.813	-17 29 35.47	0.9900539	1938.55
11/12/2024	15 10 35.558	-17 45 54.61	0.9898161	1939.02
11/13/2024	15 14 40.134	-18 01 55.21	0.9895823	1939.47
11/14/2024	15 18 45.545	-18 17 36.90	0.9893528	1939.92
11/15/2024	15 22 51.797	-18 32 59.34	0.9891278	1940.36
11/16/2024	15 26 58.891	-18 48 02.18	0.9889077	1940.80
11/17/2024	15 31 06.829	-19 02 45.08	0.9886924	1941.22
11/18/2024	15 35 15.607	-19 17 07.69	0.9884820	1941.63
11/19/2024	15 39 25.223	-19 31 09.63	0.9882764	1942.04
11/20/2024	15 43 35.669	-19 44 50.54	0.9880753	1942.43
11/21/2024	15 47 46.939	-19 58 10.05	0.9878787	1942.82
11/22/2024	15 51 59.025	-20 11 07.77	0.9876862	1943.20
11/23/2024	15 56 11.917	-20 23 43.34	0.9874977	1943.57
11/24/2024	16 00 25.603	-20 35 56.40	0.9873129	1943.93
11/25/2024	16 04 40.072	-20 47 46.59	0.9871317	1944.29
11/26/2024	16 08 55.310	-20 59 13.56	0.9869540	1944.64
11/27/2024	16 13 11.300	-21 10 16.97	0.9867795	1944.98
11/28/2024	16 17 28.025	-21 20 56.49	0.9866083	1945.32
11/29/2024	16 21 45.466	-21 31 11.80	0.9864400	1945.65
11/30/2024	16 26 03.601	-21 41 02.58	0.9862748	1945.98
12/01/2024	16 30 22.408	-21 50 28.54	0.9861125	1946.30
12/02/2024	16 34 41.861	-21 59 29.39	0.9859532	1946.61
12/03/2024	16 39 01.932	-22 08 04.83	0.9857968	1946.92
12/04/2024	16 43 22.594	-22 16 14.60	0.9856435	1947.22
12/05/2024	16 47 43.817	-22 23 58.43	0.9854934	1947.52
12/06/2024	16 52 05.569	-22 31 16.07	0.9853467	1947.81
12/07/2024	16 56 27.820	-22 38 07.29	0.9852037	1948.09
12/08/2024	17 00 50.541	-22 44 31.86	0.9850647	1948.37
12/09/2024	17 05 13.704	-22 50 29.57	0.9849301	1948.63
12/10/2024	17 09 37.279	-22 56 00.23	0.9848001	1948.89
12/11/2024	17 14 01.242	-23 01 03.69	0.9846752	1949.14
12/12/2024	17 18 25.565	-23 05 39.79	0.9845558	1949.37
12/13/2024	17 22 50.223	-23 09 48.41	0.9844422	1949.60
12/14/2024	17 27 15.188	-23 13 29.44	0.9843346	1949.81

Sun - Apparent data

Date	Right Ascension	Declination	Distance	Diameter
0 h TT	h m s	d m s	au	arc sec
12/15/2024	17 31 40.434	-23 16 42.78	0.9842332	1950.01
12/16/2024	17 36 05.930	-23 19 28.32	0.9841382	1950.20
12/17/2024	17 40 31.646	-23 21 45.98	0.9840494	1950.38
12/18/2024	17 44 57.552	-23 23 35.66	0.9839669	1950.54
12/19/2024	17 49 23.618	-23 24 57.27	0.9838904	1950.69
12/20/2024	17 53 49.812	-23 25 50.74	0.9838198	1950.83
12/21/2024	17 58 16.104	-23 26 16.02	0.9837548	1950.96
12/22/2024	18 02 42.461	-23 26 13.06	0.9836952	1951.08
12/23/2024	18 07 08.852	-23 25 41.84	0.9836408	1951.19
12/24/2024	18 11 35.244	-23 24 42.35	0.9835915	1951.29
12/25/2024	18 16 01.602	-23 23 14.61	0.9835469	1951.37
12/26/2024	18 20 27.892	-23 21 18.63	0.9835069	1951.45
12/27/2024	18 24 54.080	-23 18 54.47	0.9834712	1951.52
12/28/2024	18 29 20.131	-23 16 02.20	0.9834398	1951.59
12/29/2024	18 33 46.007	-23 12 41.89	0.9834124	1951.64
12/30/2024	18 38 11.671	-23 08 53.63	0.9833889	1951.69
12/31/2024	18 42 37.086	-23 04 37.56	0.9833692	1951.73
01/01/2025	18 47 02.214	-22 59 53.79	0.9833532	1951.76



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	
12/31/2023	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
01/03/2024	12 01 29.126	01 50 46.86	403740.118	54.31051	1775.93	60.9
01/04/2024	12 43 33.134	-03 46 38.30	401419.273	54.62454	1786.20	51.5
01/05/2024	13 26 47.445	-09 21 04.85	397886.222	55.10962	1802.06	42.0
01/06/2024	14 12 22.054	-14 41 43.23	393301.448	55.75209	1823.06	32.4
01/07/2024	15 01 25.834	-19 34 33.89	387934.806	56.52343	1848.28	23.4
01/08/2024	15 54 55.742	-23 41 17.44	382155.377	57.37833	1876.23	15.1
01/09/2024	16 53 15.396	-26 39 27.83	376406.295	58.25479	1904.89	8.3
01/10/2024	17 55 47.277	-28 05 37.34	371162.267	59.07793	1931.80	3.2
01/11/2024	19 00 39.845	-27 41 49.13	366871.574	59.76893	1954.40	0.5
01/12/2024	20 05 16.797	-25 22 59.67	363891.134	60.25852	1970.40	0.5
01/13/2024	21 07 20.939	-21 19 57.77	362430.120	60.50146	1978.35	3.4
01/14/2024	22 05 43.591	-15 55 41.35	362519.763	60.48650	1977.86	9.0
01/15/2024	23 00 28.664	-09 38 14.82	364020.481	60.23711	1969.70	16.8
01/16/2024	23 52 27.716	-02 55 05.25	366664.236	59.80274	1955.50	26.5
01/17/2024	00 42 53.257	03 49 37.49	370117.355	59.24473	1937.26	37.2
01/18/2024	01 33 01.030	10 15 16.04	374044.198	58.62270	1916.92	48.3
01/19/2024	02 23 59.018	16 03 52.19	378155.929	57.98523	1896.08	59.3
01/20/2024	03 16 37.887	20 59 09.83	382236.984	57.36608	1875.83	69.6
01/21/2024	04 11 19.897	24 46 22.15	386149.512	56.78478	1856.83	78.7
01/22/2024	05 07 48.345	27 13 12.41	389820.755	56.24995	1839.34	86.5
01/23/2024	06 05 05.455	28 11 58.90	393220.100	55.76363	1823.44	92.6
01/24/2024	07 01 46.848	27 41 39.21	396332.518	55.32568	1809.12	96.9
01/25/2024	07 56 29.755	25 48 22.84	399134.133	54.93730	1796.42	99.3
01/26/2024	08 48 19.278	22 43 55.06	401574.273	54.60345	1785.51	99.8
01/27/2024	09 36 58.851	18 42 46.78	403566.610	54.33386	1776.69	98.4
01/28/2024	10 22 45.204	13 59 38.53	404990.225	54.14285	1770.45	95.3
01/29/2024	11 06 17.107	08 47 48.94	405699.806	54.04814	1767.35	90.6
01/30/2024	11 48 25.555	03 18 49.14	405543.080	54.06903	1768.03	84.5
01/31/2024	12 30 08.021	-02 17 16.55	404383.053	54.22415	1773.10	77.2
02/01/2024	13 12 26.064	-07 51 01.52	402122.597	54.52899	1783.07	68.8
02/02/2024	13 56 24.438	-13 12 29.70	398729.146	54.99310	1798.25	59.6
02/03/2024	14 43 09.254	-18 09 56.94	394257.345	55.61691	1818.64	49.9
02/04/2024	15 33 41.970	-22 28 33.57	388867.127	56.38790	1843.85	39.8
02/05/2024	16 28 45.455	-25 49 41.26	382833.750	57.27665	1872.91	29.9
02/06/2024	17 28 21.124	-27 51 49.45	376544.983	58.23333	1904.19	20.6
02/07/2024	18 31 26.830	-28 14 25.57	370479.655	59.18679	1935.36	12.3
02/08/2024	19 35 58.982	-26 44 26.10	365162.785	60.04865	1963.54	5.8
02/09/2024	20 39 34.322	-23 22 15.16	361097.435	60.72477	1985.65	1.6
02/10/2024	21 40 27.595	-18 22 58.30	358683.007	61.13357	1999.01	0.1
02/11/2024	22 38 01.932	-12 12 14.44	358140.567	61.22618	2002.04	1.7
02/12/2024	23 32 40.708	-05 20 04.84	359470.431	60.99965	1994.63	6.3
02/13/2024	00 25 22.248	01 44 04.20	362458.757	60.49668	1978.19	13.3
02/14/2024	01 17 17.023	08 33 59.82	366730.807	59.79188	1955.15	22.3
02/15/2024	02 09 32.049	14 47 26.47	371830.590	58.97173	1928.33	32.6
02/16/2024	03 02 59.218	20 05 49.17	377300.760	58.11667	1900.37	43.3
02/17/2024	03 58 04.251	24 13 53.26	382743.398	57.29017	1873.35	54.1
02/18/2024	04 54 37.103	27 00 03.76	387854.036	56.53520	1848.67	64.4

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	
02/19/2024	05 51 49.826	28 17 33.25	392430.755	55.87580	1827.11	73.8
02/20/2024	06 48 28.515	28 05 37.58	396364.663	55.32119	1808.97	82.0
02/21/2024	07 43 17.629	26 29 51.72	399618.944	54.87065	1794.24	88.9
02/22/2024	08 35 24.006	23 40 52.55	402202.651	54.51813	1782.72	94.2
02/23/2024	09 24 28.185	19 52 02.86	404144.203	54.25620	1774.15	97.8
02/24/2024	10 10 41.714	15 17 22.41	405468.332	54.07900	1768.36	99.6
02/25/2024	10 54 37.705	10 10 06.82	406179.340	53.98433	1765.26	99.7
02/26/2024	11 37 01.669	04 42 17.86	406252.484	53.97461	1764.95	98.0
02/27/2024	12 18 45.578	-00 55 09.47	405634.325	54.05687	1767.63	94.7
02/28/2024	13 00 45.003	-06 31 57.61	404251.790	54.24176	1773.68	89.7
02/29/2024	13 43 57.896	-11 57 42.94	402028.769	54.54171	1783.49	83.2
03/01/2024	14 29 23.130	-17 01 02.66	398908.374	54.96839	1797.44	75.4
03/02/2024	15 17 56.474	-21 28 39.37	394878.481	55.52942	1815.78	66.5
03/03/2024	16 10 21.294	-25 04 41.80	389997.766	56.22441	1838.51	56.7
03/04/2024	17 06 52.594	-27 31 00.14	384418.772	57.04046	1865.19	46.4
03/05/2024	18 06 58.769	-28 29 08.21	378403.429	57.94730	1894.84	35.9
03/06/2024	19 09 15.229	-27 44 32.74	372325.038	58.89341	1925.77	25.6
03/07/2024	20 11 45.484	-25 11 30.75	366649.722	59.80510	1955.58	16.3
03/08/2024	21 12 44.519	-20 56 09.69	361891.567	60.59150	1981.29	8.5
03/09/2024	22 11 15.325	-15 15 48.20	358541.381	61.15772	1999.80	3.0
03/10/2024	23 07 17.027	-08 35 35.18	356979.902	61.42527	2008.55	0.3
03/11/2024	00 01 30.260	-01 24 32.31	357398.535	61.35331	2006.20	0.6
03/12/2024	00 54 56.394	05 47 44.81	359755.363	60.95133	1993.05	4.0
03/13/2024	01 48 39.673	12 33 29.49	363784.077	60.27626	1970.98	10.0
03/14/2024	02 43 32.517	18 28 16.82	369052.065	59.41576	1942.85	18.1
03/15/2024	03 40 01.825	23 12 06.12	375045.060	58.46624	1911.80	27.6
03/16/2024	04 37 57.393	26 30 21.17	381250.823	57.51448	1880.69	37.9
03/17/2024	05 36 28.879	28 15 00.72	387222.535	56.62741	1851.68	48.3
03/18/2024	06 34 18.559	28 25 28.70	392615.190	55.84955	1826.25	58.5
03/19/2024	07 30 07.642	27 08 09.13	397197.460	55.20519	1805.18	68.1
03/20/2024	08 23 01.830	24 34 28.09	400845.535	54.70273	1788.75	76.8
03/21/2024	09 12 42.592	20 58 13.11	403525.567	54.33939	1776.87	84.3
03/22/2024	09 59 23.369	16 33 20.90	405270.104	54.10546	1769.22	90.6
03/23/2024	10 43 39.007	11 32 48.05	406152.440	53.98791	1765.38	95.3
03/24/2024	11 26 15.930	06 08 17.78	406261.953	53.97335	1764.90	98.5
03/25/2024	12 08 05.916	00 30 39.77	405682.946	54.05039	1767.42	99.9
03/26/2024	12 50 03.088	-05 09 35.27	404479.217	54.21126	1772.68	99.6
03/27/2024	13 33 02.576	-10 41 36.28	402686.182	54.45266	1780.58	97.4
03/28/2024	14 17 59.032	-15 53 32.23	400311.670	54.77569	1791.14	93.4
03/29/2024	15 05 43.016	-20 31 57.16	397345.575	55.18461	1804.51	87.8
03/30/2024	15 56 53.179	-24 21 32.83	393777.442	55.68470	1820.86	80.5
03/31/2024	16 51 43.419	-27 05 34.65	389619.907	56.27895	1840.29	71.9
04/01/2024	17 49 48.588	-28 27 33.16	384934.826	56.96399	1862.69	62.2
04/02/2024	18 49 59.286	-28 14 19.73	379857.819	57.72541	1887.58	51.6
04/03/2024	19 50 37.434	-26 19 39.63	374615.748	58.53325	1913.99	40.7
04/04/2024	20 50 10.267	-22 46 23.62	369530.526	59.33883	1940.33	29.8
04/05/2024	21 47 42.200	-17 46 12.88	365002.425	60.07504	1964.40	19.8
04/06/2024	22 43 06.200	-11 37 41.15	361468.134	60.66249	1983.61	11.1
04/07/2024	23 36 55.476	-04 44 03.14	359335.056	61.02263	1995.39	4.7
04/08/2024	00 30 07.271	02 28 27.87	358903.464	61.09602	1997.79	0.9

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	
04/09/2024	01 23 46.939	09 32 05.97	360298.045	60.85951	1990.05	0.1
04/10/2024	02 18 53.170	15 59 08.46	363432.573	60.33456	1972.89	2.3
04/11/2024	03 16 02.170	21 23 57.25	368021.168	59.58221	1948.29	7.1
04/12/2024	04 15 11.236	25 25 30.12	373631.338	58.68749	1919.04	14.1
04/13/2024	05 15 29.306	27 50 07.99	379759.163	57.74041	1888.07	22.6
04/14/2024	06 15 26.436	28 33 43.20	385903.749	56.82095	1858.01	32.2
04/15/2024	07 13 24.432	27 41 43.40	391625.060	55.99077	1830.87	42.1
04/16/2024	08 08 11.533	25 26 38.44	396579.370	55.29124	1807.99	52.1
04/17/2024	08 59 19.843	22 04 06.97	400534.011	54.74528	1790.14	61.7
04/18/2024	09 47 01.504	17 49 40.67	403366.335	54.36084	1777.57	70.8
04/19/2024	10 31 54.782	12 57 05.50	405052.007	54.13459	1770.18	79.0
04/20/2024	11 14 51.045	07 38 08.85	405646.668	54.05523	1767.58	86.1
04/21/2024	11 56 46.740	02 03 15.31	405263.845	54.10629	1769.25	92.0
04/22/2024	12 38 39.718	-03 37 38.95	404051.295	54.26868	1774.56	96.4
04/23/2024	13 21 27.834	-09 14 09.44	402167.791	54.52286	1782.87	99.1
04/24/2024	14 06 07.617	-14 34 32.28	399762.548	54.85093	1793.60	100.0
04/25/2024	14 53 30.826	-19 25 05.99	396959.695	55.23826	1806.26	99.0
04/26/2024	15 44 16.740	-23 30 00.10	393850.133	55.67442	1820.52	96.0
04/27/2024	16 38 39.347	-26 31 55.23	390492.466	56.15318	1836.18	91.1
04/28/2024	17 36 13.010	-28 14 02.14	386923.437	56.67119	1853.11	84.3
04/29/2024	18 35 47.280	-28 23 18.31	383176.593	57.22539	1871.23	75.9
04/30/2024	19 35 42.656	-26 53 53.29	379306.023	57.80940	1890.33	66.2
05/01/2024	20 34 24.861	-23 48 49.14	375410.286	58.40936	1909.94	55.5
05/02/2024	21 30 56.909	-19 19 01.71	371650.411	59.00032	1929.27	44.2
05/03/2024	22 25 10.630	-13 40 48.84	368255.306	59.54433	1947.05	33.1
05/04/2024	23 17 38.704	-07 13 35.41	365508.841	59.99179	1961.68	22.6
05/05/2024	00 09 19.353	-00 18 48.54	363715.907	60.28755	1971.35	13.5
05/06/2024	01 01 22.057	06 40 14.02	363150.638	60.38141	1974.42	6.4
05/07/2024	01 54 55.024	13 18 30.09	363997.471	60.24092	1969.83	1.9
05/08/2024	02 50 50.997	19 10 00.97	366301.585	59.86195	1957.44	0.1
05/09/2024	03 49 28.983	23 49 56.95	369944.962	59.27234	1938.16	1.1
05/10/2024	04 50 16.334	26 58 10.54	374656.243	58.52692	1913.79	4.7
05/11/2024	05 51 45.647	28 23 26.40	380050.489	57.69614	1886.62	10.5
05/12/2024	06 51 59.907	28 05 56.75	385685.613	56.85309	1859.06	17.9
05/13/2024	07 49 16.498	26 16 16.85	391120.112	56.06306	1833.23	26.5
05/14/2024	08 42 40.271	23 11 05.58	395960.813	55.37762	1810.82	35.8
05/15/2024	09 32 08.146	19 08 14.75	399895.622	54.83268	1793.00	45.4
05/16/2024	10 18 14.209	14 23 43.85	402711.307	54.44927	1780.46	55.0
05/17/2024	11 01 52.027	09 10 42.96	404298.843	54.23545	1773.47	64.3
05/18/2024	11 44 02.745	03 39 59.83	404649.336	54.18847	1771.94	73.0
05/19/2024	12 25 49.420	-01 58 55.52	403842.961	54.29668	1775.48	81.0
05/20/2024	13 08 15.107	-07 36 35.71	402032.538	54.54120	1783.47	87.9
05/21/2024	13 52 21.885	-13 02 22.82	399422.891	54.89758	1795.12	93.4
05/22/2024	14 39 08.217	-18 03 25.84	396247.126	55.33760	1809.51	97.4
05/23/2024	15 29 21.922	-22 24 04.72	392741.572	55.83158	1825.66	99.6
05/24/2024	16 23 26.851	-25 46 10.96	389122.010	56.35096	1842.64	99.7
05/25/2024	17 21 05.555	-27 51 04.58	385564.633	56.87093	1859.64	97.6
05/26/2024	18 21 08.810	-28 23 20.81	382195.355	57.37233	1876.04	93.4
05/27/2024	19 21 47.906	-27 15 15.64	379090.091	57.84233	1891.40	87.1
05/28/2024	20 21 12.001	-24 29 18.54	376286.464	58.27334	1905.50	78.9

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	
05/29/2024	21 18 07.972	-20 17 11.65	373804.490	58.66030	1918.15	69.1
05/30/2024	22 12 17.382	-14 56 20.11	371671.054	58.99705	1929.16	58.3
05/31/2024	23 04 08.790	-08 46 26.14	369941.307	59.27293	1938.18	46.9
06/01/2024	23 54 40.281	-02 07 39.83	368710.077	59.47088	1944.65	35.6
06/02/2024	00 45 03.870	04 39 34.78	368108.214	59.56812	1947.83	24.9
06/03/2024	01 36 33.880	11 14 05.41	368282.325	59.53996	1946.91	15.6
06/04/2024	02 30 15.690	17 13 22.73	369361.197	59.36603	1941.22	8.2
06/05/2024	03 26 50.412	22 14 09.10	371416.973	59.03741	1930.48	3.1
06/06/2024	04 26 15.184	25 54 30.49	374432.016	58.56198	1914.93	0.5
06/07/2024	05 27 28.705	27 57 58.43	378281.516	57.96598	1895.45	0.5
06/08/2024	06 28 39.987	28 17 53.86	382737.071	57.29111	1873.38	2.8
06/09/2024	07 27 46.860	26 59 19.41	387489.819	56.58835	1850.40	7.3
06/10/2024	08 23 21.474	24 16 35.57	392186.399	55.91062	1828.25	13.5
06/11/2024	09 14 51.981	20 28 16.06	396469.030	55.30663	1808.50	21.0
06/12/2024	10 02 35.420	15 52 32.59	400012.407	54.81667	1792.48	29.5
06/13/2024	10 47 18.621	10 44 52.65	402553.087	54.47067	1781.16	38.6
06/14/2024	11 30 01.989	05 17 38.57	403909.910	54.28767	1775.18	48.0
06/15/2024	12 11 50.485	-00 19 04.77	403995.797	54.27613	1774.80	57.5
06/16/2024	12 53 50.141	-05 56 14.13	402821.899	54.43432	1779.98	66.7
06/17/2024	13 37 07.056	-11 24 24.15	400494.894	54.75062	1790.32	75.3
06/18/2024	14 22 45.942	-16 32 25.33	397207.636	55.20377	1805.13	83.2
06/19/2024	15 11 45.174	-21 06 15.54	393222.953	55.76323	1823.43	89.9
06/20/2024	16 04 45.261	-24 48 32.64	388850.391	56.39033	1843.93	95.2
06/21/2024	17 01 50.124	-27 19 36.93	384416.546	57.04079	1865.20	98.6
06/22/2024	18 02 08.728	-28 20 51.51	380231.342	57.66870	1885.73	99.8
06/23/2024	19 03 55.314	-27 39 57.54	376554.872	58.23180	1904.14	98.7
06/24/2024	20 05 01.783	-25 15 30.04	373571.183	58.69694	1919.35	95.1
06/25/2024	21 03 46.748	-21 17 45.31	371375.422	59.04402	1930.69	89.2
06/26/2024	21 59 26.722	-16 05 18.93	369978.128	59.26703	1937.99	81.2
06/27/2024	22 52 15.259	-10 00 20.89	369325.755	59.37173	1941.41	71.4
06/28/2024	23 43 04.131	-03 25 11.17	369331.467	59.37081	1941.38	60.5
06/29/2024	00 33 04.007	03 18 58.79	369907.219	59.27839	1938.36	49.1
06/30/2024	01 23 30.753	09 51 54.40	370988.161	59.10566	1932.71	37.8
07/01/2024	02 15 34.963	15 53 31.26	372543.203	58.85892	1924.64	27.2
07/02/2024	03 10 09.811	21 03 27.25	374569.910	58.54042	1914.23	17.8
07/03/2024	04 07 34.449	25 01 44.88	377076.272	58.15127	1901.51	10.2
07/04/2024	05 07 17.155	27 31 21.37	380055.319	57.69541	1886.60	4.6
07/05/2024	06 07 52.182	28 22 02.26	383460.199	57.18307	1869.85	1.2
07/06/2024	07 07 23.635	27 33 35.13	387186.779	56.63264	1851.85	0.2
07/07/2024	08 04 08.279	25 15 52.72	391068.339	56.07048	1833.47	1.4
07/08/2024	08 57 08.745	21 45 25.99	394883.383	55.52873	1815.76	4.6
07/09/2024	09 46 19.299	17 20 45.67	398374.295	55.04209	1799.85	9.5
07/10/2024	10 32 11.971	12 18 58.13	401272.655	54.64450	1786.85	15.9
07/11/2024	11 15 39.303	06 54 20.61	403326.702	54.36618	1777.75	23.5
07/12/2024	11 57 42.503	01 18 26.40	404327.358	54.23162	1773.35	32.0
07/13/2024	12 39 25.791	-04 19 01.94	404130.537	54.25804	1774.21	41.1
07/14/2024	13 21 54.540	-09 48 58.73	402674.590	54.45423	1780.63	50.6
07/15/2024	14 06 14.418	-15 01 33.58	399992.259	54.81943	1792.57	60.1
07/16/2024	14 53 28.661	-19 44 50.92	396216.446	55.34189	1809.65	69.4
07/17/2024	15 44 30.261	-23 43 47.73	391578.557	55.99742	1831.08	78.2

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	
07/18/2024	16 39 46.470	-26 40 07.88	386397.554	56.74833	1855.64	86.0
07/19/2024	17 38 57.877	-28 14 12.42	381057.625	57.54364	1881.64	92.5
07/20/2024	18 40 45.380	-28 09 22.93	375973.333	58.32188	1907.08	97.2
07/21/2024	19 43 05.186	-26 17 44.42	371543.833	59.01725	1929.82	99.6
07/22/2024	20 43 54.083	-22 43 47.49	368102.163	59.56910	1947.86	99.4
07/23/2024	21 41 55.245	-17 43 35.40	365870.199	59.93254	1959.75	96.5
07/24/2024	22 36 54.134	-11 40 19.13	364931.653	60.08669	1964.79	91.0
07/25/2024	23 29 25.814	-04 59 29.90	365231.958	60.03728	1963.17	83.2
07/26/2024	00 20 33.294	01 54 06.36	366605.488	59.81232	1955.81	73.6
07/27/2024	01 11 29.789	08 37 38.69	368821.246	59.45295	1944.06	62.8
07/28/2024	02 03 26.092	14 50 05.37	371632.924	59.00310	1929.36	51.5
07/29/2024	02 57 18.991	20 11 45.62	374820.092	58.50134	1912.95	40.3
07/30/2024	03 53 37.197	24 24 21.86	378212.422	57.97657	1895.79	29.7
07/31/2024	04 52 06.360	27 12 17.26	381695.120	57.44752	1878.50	20.4
08/01/2024	05 51 42.746	28 25 13.24	385198.602	56.92497	1861.41	12.5
08/02/2024	06 50 47.741	28 00 55.85	388678.197	56.41531	1844.75	6.5
08/03/2024	07 47 42.102	26 06 09.12	392090.512	55.92430	1828.69	2.4
08/04/2024	08 41 19.502	22 54 36.83	395372.519	55.46002	1813.51	0.4
08/05/2024	09 31 19.655	18 43 23.26	398427.875	55.03469	1799.61	0.4
08/06/2024	10 18 01.089	13 49 34.37	401122.876	54.66490	1787.52	2.3
08/07/2024	11 02 06.346	08 28 24.82	403292.240	54.37083	1777.90	6.1
08/08/2024	11 44 29.646	02 52 47.49	404753.186	54.17456	1771.48	11.4
08/09/2024	12 26 09.903	-02 46 24.19	405325.235	54.09810	1768.98	18.1
08/10/2024	13 08 07.871	-08 19 26.29	404852.977	54.16121	1771.05	25.9
08/11/2024	13 51 25.118	-13 36 40.73	403229.343	54.37931	1778.18	34.6
08/12/2024	14 37 02.450	-18 27 25.66	400417.411	54.76122	1790.66	43.9
08/13/2024	15 25 55.154	-22 38 50.20	396469.021	55.30663	1808.50	53.7
08/14/2024	16 18 42.374	-25 55 16.81	391538.272	56.00318	1831.27	63.5
08/15/2024	17 15 30.117	-27 58 54.72	385887.250	56.82338	1858.09	73.1
08/16/2024	18 15 34.400	-28 32 14.43	379880.347	57.72199	1887.47	81.9
08/17/2024	19 17 20.441	-27 22 43.64	373962.883	58.63545	1917.34	89.6
08/18/2024	20 18 50.491	-24 27 33.53	368620.743	59.48529	1945.12	95.5
08/19/2024	21 18 28.402	-19 55 43.76	364321.647	60.18731	1968.07	99.0
08/20/2024	22 15 30.451	-14 06 19.77	361445.972	60.66621	1983.73	99.9
08/21/2024	23 10 07.158	-07 24 37.92	360223.234	60.87215	1990.47	97.7
08/22/2024	00 03 06.528	-00 18 12.89	360694.067	60.79269	1987.87	92.8
08/23/2024	00 55 34.508	06 45 45.34	362711.770	60.45447	1976.81	85.4
08/24/2024	01 48 39.129	13 21 59.96	365983.232	59.91403	1959.14	76.1
08/25/2024	02 43 16.922	19 07 46.09	370134.451	59.24200	1937.17	65.6
08/26/2024	03 39 58.574	23 43 19.26	374779.499	58.50767	1913.16	54.5
08/27/2024	04 38 34.755	26 52 57.41	379575.394	57.76837	1888.99	43.5
08/28/2024	05 38 09.955	28 26 52.08	384254.364	57.06487	1865.98	33.1
08/29/2024	06 37 14.824	28 23 02.72	388633.348	56.42183	1844.96	23.7
08/30/2024	07 34 16.617	26 47 42.96	392605.558	55.85092	1826.29	15.5
08/31/2024	08 28 10.492	23 53 31.89	396120.673	55.35527	1810.09	9.0
09/01/2024	09 18 33.491	19 56 24.59	399160.005	54.93374	1796.31	4.2
09/02/2024	10 05 39.618	15 12 39.66	401712.060	54.58472	1784.89	1.2
09/03/2024	10 50 06.695	09 57 18.38	403752.639	54.30882	1775.87	0.0
09/04/2024	11 32 44.539	04 23 32.98	405232.350	54.11050	1769.39	0.8
09/05/2024	12 14 27.759	-01 17 01.65	406072.960	53.99847	1765.73	3.3

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	
09/06/2024	12 56 12.477	-06 53 54.42	406172.668	53.98522	1765.29	7.5
09/07/2024	13 38 55.044	-12 16 54.11	405419.258	54.08555	1768.57	13.2
09/08/2024	14 23 30.753	-17 15 20.39	403709.290	54.31465	1776.06	20.3
09/09/2024	15 10 50.489	-21 37 15.99	400971.129	54.68559	1788.19	28.5
09/10/2024	16 01 33.296	-25 08 53.84	397189.485	55.20630	1805.22	37.7
09/11/2024	16 55 54.060	-27 34 46.14	392428.974	55.87606	1827.12	47.5
09/12/2024	17 53 29.683	-28 39 10.78	386853.747	56.68140	1853.45	57.8
09/13/2024	18 53 13.828	-28 09 09.76	380739.264	57.59176	1883.21	68.0
09/14/2024	19 53 31.616	-25 58 11.27	374470.937	58.55589	1914.73	77.7
09/15/2024	20 52 52.463	-22 08 48.54	368523.518	59.50099	1945.64	86.4
09/16/2024	21 50 21.563	-16 52 57.49	363416.187	60.33728	1972.98	93.4
09/17/2024	22 45 51.836	-10 30 15.71	359643.607	60.97027	1993.67	98.1
09/18/2024	23 39 56.369	-03 25 39.61	357593.133	61.31992	2005.11	100.0
09/19/2024	00 33 32.506	03 52 51.95	357469.567	61.34112	2005.80	98.8
09/20/2024	01 27 45.615	10 56 20.90	359253.201	61.03653	1995.84	94.6
09/21/2024	02 23 33.552	17 16 46.65	362707.803	60.45513	1976.83	87.9
09/22/2024	03 21 29.802	22 29 04.19	367435.467	59.67720	1951.40	79.2
09/23/2024	04 21 26.414	26 13 17.50	372957.408	58.79354	1922.51	69.2
09/24/2024	05 22 25.427	28 17 09.17	378794.470	57.88747	1892.88	58.5
09/25/2024	06 22 51.177	28 37 57.05	384528.365	57.02420	1864.66	47.9
09/26/2024	07 21 03.784	27 22 29.45	389836.485	56.24768	1839.27	37.6
09/27/2024	08 15 54.033	24 44 26.86	394502.280	55.58238	1817.51	28.1
09/28/2024	09 06 58.442	21 00 30.43	398407.412	55.03752	1799.70	19.6
09/29/2024	09 54 32.975	16 27 12.97	401512.478	54.61185	1785.78	12.5
09/30/2024	10 39 18.025	11 19 24.92	403832.076	54.29814	1775.52	6.9
10/01/2024	11 22 05.374	05 49 59.51	405408.727	54.08695	1768.62	2.8
10/02/2024	12 03 50.470	00 10 20.10	406289.190	53.96973	1764.79	0.6
10/03/2024	12 45 28.984	-05 28 58.11	406505.968	53.94095	1763.84	0.0
10/04/2024	13 27 55.483	-10 57 25.11	406066.120	53.99938	1765.76	1.3
10/05/2024	14 12 02.202	-16 03 57.01	404948.648	54.14841	1770.63	4.4
10/06/2024	14 58 36.056	-20 36 24.67	403110.776	54.39530	1778.70	9.1
10/07/2024	15 48 12.333	-24 21 19.13	400502.408	54.74960	1790.28	15.4
10/08/2024	16 41 04.618	-27 04 11.56	397087.150	55.22053	1805.68	23.1
10/09/2024	17 36 53.854	-28 30 49.50	392867.500	55.81368	1825.08	32.0
10/10/2024	18 34 44.292	-28 29 33.99	387911.164	56.52688	1848.39	41.9
10/11/2024	19 33 15.009	-26 53 59.50	382374.579	57.34543	1875.16	52.4
10/12/2024	20 31 06.207	-23 44 42.53	376518.633	58.23740	1904.32	63.1
10/13/2024	21 27 26.241	-19 09 31.02	370710.220	59.14998	1934.16	73.5
10/14/2024	22 22 04.574	-13 22 20.30	365402.629	60.00923	1962.25	83.0
10/15/2024	23 15 28.594	-06 42 00.80	361089.496	60.72611	1985.69	91.0
10/16/2024	00 08 31.964	00 28 26.99	358233.329	61.21032	2001.52	96.7
10/17/2024	01 02 21.218	07 42 25.68	357180.619	61.39074	2007.42	99.6
10/18/2024	01 58 01.570	14 30 41.60	358086.936	61.23535	2002.34	99.5
10/19/2024	02 56 19.239	20 23 27.66	360878.501	60.76161	1986.85	96.5
10/20/2024	03 57 19.477	24 53 46.25	365265.441	60.03178	1962.99	90.8
10/21/2024	05 00 08.710	27 41 57.62	370801.132	59.13547	1933.68	83.0
10/22/2024	06 02 59.186	28 39 50.30	376965.104	58.16842	1902.07	73.8
10/23/2024	07 03 45.793	27 52 02.99	383243.579	57.21539	1870.91	63.8
10/24/2024	08 00 54.178	25 33 11.39	389190.197	56.34109	1842.32	53.6
10/25/2024	08 53 46.438	22 02 22.10	394461.176	55.58817	1817.70	43.5

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	
10/26/2024	09 42 35.730	17 38 27.06	398827.512	54.97954	1797.80	33.9
10/27/2024	10 28 06.510	12 37 40.66	402170.159	54.52254	1782.86	25.1
10/28/2024	11 11 16.852	07 13 20.66	404464.172	54.21327	1772.75	17.3
10/29/2024	11 53 08.197	01 36 33.73	405756.555	54.04058	1767.10	10.8
10/30/2024	12 34 41.043	-04 02 39.43	406141.257	53.98939	1765.43	5.7
10/31/2024	13 16 53.560	-09 34 20.72	405734.066	54.04358	1767.20	2.1
11/01/2024	14 00 40.562	-14 47 41.81	404649.861	54.18840	1771.94	0.3
11/02/2024	14 46 50.726	-19 30 27.34	402984.646	54.41233	1779.26	0.3
11/03/2024	15 36 00.353	-23 28 44.04	400804.603	54.70831	1788.93	2.1
11/04/2024	16 28 23.205	-26 27 32.80	398143.908	55.07395	1800.89	5.8
11/05/2024	17 23 39.408	-28 12 22.03	395012.042	55.51064	1815.17	11.3
11/06/2024	18 20 51.423	-28 31 38.98	391410.039	56.02153	1831.87	18.4
11/07/2024	19 18 35.969	-27 19 29.37	387353.639	56.60824	1851.06	27.0
11/08/2024	20 15 30.963	-24 37 03.49	382899.886	57.26675	1872.59	36.8
11/09/2024	21 10 42.932	-20 32 04.55	378172.441	57.98270	1895.99	47.4
11/10/2024	22 03 59.936	-15 17 01.21	373379.652	58.72705	1920.33	58.4
11/11/2024	22 55 48.365	-09 07 29.11	368818.640	59.45337	1944.08	69.3
11/12/2024	23 47 01.917	-02 21 33.80	364858.805	60.09869	1965.18	79.5
11/13/2024	00 38 49.950	04 39 48.84	361900.845	60.58995	1981.24	88.2
11/14/2024	01 32 26.424	11 32 16.16	360313.657	60.85688	1989.97	94.8
11/15/2024	02 28 55.893	17 48 03.00	360361.072	60.84887	1989.70	98.8
11/16/2024	03 28 52.177	22 57 48.97	362138.890	60.55012	1979.94	99.9
11/17/2024	04 31 51.838	26 34 54.79	365543.697	59.98607	1961.50	98.1
11/18/2024	05 36 19.743	28 21 37.00	370284.889	59.21793	1936.38	93.7
11/19/2024	06 39 51.725	28 14 23.01	375934.806	58.32785	1907.28	87.3
11/20/2024	07 40 11.972	26 24 06.53	381999.019	57.40182	1877.00	79.2
11/21/2024	08 36 03.025	23 10 47.49	387986.249	56.51594	1848.04	70.1
11/22/2024	09 27 15.467	18 56 33.48	393463.641	55.72911	1822.31	60.5
11/23/2024	10 14 27.469	14 01 00.67	398092.025	55.08113	1801.12	50.7
11/24/2024	10 58 40.018	08 39 44.41	401642.329	54.59420	1785.20	41.2
11/25/2024	11 41 00.827	03 04 50.54	403997.255	54.27594	1774.80	32.0
11/26/2024	12 22 37.135	-02 33 45.77	405142.487	54.12250	1769.78	23.6
11/27/2024	13 04 33.527	-08 06 54.04	405150.795	54.12139	1769.74	16.1
11/28/2024	13 47 51.215	-13 24 50.50	404161.316	54.25390	1774.08	9.8
11/29/2024	14 33 26.013	-18 16 15.88	402355.744	54.49739	1782.04	4.9
11/30/2024	15 22 02.711	-22 27 39.96	399933.165	54.82753	1792.83	1.7
12/01/2024	16 14 04.493	-25 43 34.48	397085.776	55.22072	1805.69	0.2
12/02/2024	17 09 19.328	-27 48 02.50	393978.360	55.65630	1819.93	0.7
12/03/2024	18 06 51.539	-28 27 33.30	390734.700	56.11836	1835.04	3.3
12/04/2024	19 05 10.509	-27 34 32.99	387433.736	56.59654	1850.67	7.9
12/05/2024	20 02 39.497	-25 09 40.75	384116.858	57.08530	1866.65	14.4
12/06/2024	20 58 09.292	-21 21 26.25	380805.587	57.58173	1882.88	22.6
12/07/2024	21 51 16.392	-16 23 39.50	377526.397	58.08193	1899.24	32.3
12/08/2024	22 42 20.879	-10 32 44.64	374337.265	58.57680	1915.42	42.9
12/09/2024	23 32 13.806	-04 06 04.14	371349.177	59.04819	1930.83	54.1
12/10/2024	00 22 04.283	02 38 10.21	368735.574	59.46677	1944.52	65.3
12/11/2024	01 13 09.332	09 20 08.45	366724.069	59.79298	1955.18	75.8
12/12/2024	02 06 43.771	15 37 22.06	365567.972	59.98209	1961.37	85.0
12/13/2024	03 03 44.777	21 04 30.25	365500.638	59.99314	1961.73	92.3
12/14/2024	04 04 27.733	25 15 05.15	366682.139	59.79982	1955.41	97.3

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	
12/15/2024	05 08 00.566	27 46 10.72	369152.796	59.39955	1942.32	99.6
12/16/2024	06 12 20.428	28 24 58.14	372808.022	58.81710	1923.28	99.3
12/17/2024	07 14 53.538	27 13 23.01	377402.506	58.10100	1899.86	96.5
12/18/2024	08 13 38.105	24 26 46.50	382581.755	57.31438	1874.14	91.6
12/19/2024	09 07 41.910	20 27 31.18	387930.681	56.52403	1848.30	84.9
12/20/2024	09 57 17.098	15 38 16.53	393026.204	55.79114	1824.34	77.0
12/21/2024	10 43 14.405	10 18 11.27	397483.446	55.16547	1803.88	68.2
12/22/2024	11 26 40.415	04 42 05.29	400990.094	54.68300	1788.11	58.9
12/23/2024	12 08 45.059	-00 58 38.27	403327.910	54.36602	1777.74	49.5
12/24/2024	12 50 36.865	-06 34 35.48	404382.868	54.22418	1773.11	40.1
12/25/2024	13 33 21.762	-11 56 50.07	404146.054	54.25595	1774.14	31.1
12/26/2024	14 18 01.983	-16 55 29.96	402707.064	54.44984	1780.48	22.8
12/27/2024	15 05 32.249	-21 18 41.24	400240.848	54.78538	1791.45	15.3
12/28/2024	15 56 30.860	-24 51 58.35	396988.423	55.23426	1806.13	9.0
12/29/2024	16 51 05.361	-27 19 03.94	393231.876	55.76196	1823.38	4.2
12/30/2024	17 48 38.258	-28 24 12.57	389264.869	56.33028	1841.97	1.2
12/31/2024	18 47 45.757	-27 56 06.87	385361.380	56.90093	1860.62	0.2
01/01/2025	19 46 40.476	-25 51 45.94	381747.112	57.43970	1878.24	1.5



## 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		
12/31/2023	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
01/03/2024	17	26	55.422	-20	18	05.50	0.8171978	0.3534522	8.24	0.2	106.8
01/04/2024	17	27	44.651	-20	24	51.18	0.8377881	0.3591453	8.03	0.0	102.4
01/05/2024	17	29	07.310	-20	32	49.70	0.8586336	0.3649127	7.84	-0.0	98.3
01/06/2024	17	31	00.481	-20	41	46.26	0.8795816	0.3707157	7.65	-0.1	94.5
01/07/2024	17	33	21.358	-20	51	26.74	0.9005036	0.3765191	7.47	-0.2	90.9
01/08/2024	17	36	07.303	-21	01	37.99	0.9212932	0.3822907	7.30	-0.2	87.6
01/09/2024	17	39	15.870	-21	12	07.88	0.9418627	0.3880013	7.15	-0.2	84.4
01/10/2024	17	42	44.827	-21	22	45.41	0.9621412	0.3936246	6.99	-0.2	81.4
01/11/2024	17	46	32.145	-21	33	20.63	0.9820715	0.3991372	6.85	-0.2	78.6
01/12/2024	17	50	35.998	-21	43	44.63	1.0016084	0.4045178	6.72	-0.2	75.9
01/13/2024	17	54	54.747	-21	53	49.46	1.0207167	0.4097475	6.59	-0.2	73.3
01/14/2024	17	59	26.926	-22	03	28.03	1.0393695	0.4148097	6.48	-0.2	70.9
01/15/2024	18	04	11.231	-22	12	34.06	1.0575470	0.4196893	6.36	-0.2	68.6
01/16/2024	18	09	06.499	-22	21	01.96	1.0752348	0.4243731	6.26	-0.2	66.4
01/17/2024	18	14	11.693	-22	28	46.80	1.0924232	0.4288495	6.16	-0.2	64.3
01/18/2024	18	19	25.889	-22	35	44.23	1.1091062	0.4331079	6.07	-0.2	62.3
01/19/2024	18	24	48.263	-22	41	50.36	1.1252808	0.4371393	5.98	-0.2	60.4
01/20/2024	18	30	18.075	-22	47	01.77	1.1409464	0.4409356	5.90	-0.2	58.6
01/21/2024	18	35	54.661	-22	51	15.39	1.1561041	0.4444897	5.82	-0.2	56.8
01/22/2024	18	41	37.425	-22	54	28.51	1.1707564	0.4477953	5.75	-0.2	55.1
01/23/2024	18	47	25.829	-22	56	38.68	1.1849069	0.4508472	5.68	-0.2	53.5
01/24/2024	18	53	19.386	-22	57	43.73	1.1985599	0.4536404	5.62	-0.2	52.0
01/25/2024	18	59	17.658	-22	57	41.71	1.2117202	0.4561710	5.55	-0.2	50.5
01/26/2024	19	05	20.247	-22	56	30.85	1.2243930	0.4584353	5.50	-0.2	49.0
01/27/2024	19	11	26.791	-22	54	09.57	1.2365834	0.4604304	5.44	-0.2	47.6
01/28/2024	19	17	36.961	-22	50	36.44	1.2482967	0.4621536	5.39	-0.2	46.3
01/29/2024	19	23	50.459	-22	45	50.19	1.2595379	0.4636028	5.34	-0.2	45.0
01/30/2024	19	30	07.011	-22	39	49.64	1.2703117	0.4647763	5.30	-0.2	43.7
01/31/2024	19	36	26.368	-22	32	33.75	1.2806226	0.4656726	5.26	-0.2	42.5
02/01/2024	19	42	48.303	-22	24	01.56	1.2904744	0.4662909	5.22	-0.2	41.3
02/02/2024	19	49	12.608	-22	14	12.24	1.2998707	0.4666302	5.18	-0.3	40.1
02/03/2024	19	55	39.094	-22	03	04.99	1.3088141	0.4666904	5.14	-0.3	38.9
02/04/2024	20	02	07.585	-21	50	39.12	1.3173070	0.4664712	5.11	-0.3	37.8
02/05/2024	20	08	37.925	-21	36	54.00	1.3253506	0.4659730	5.08	-0.3	36.6
02/06/2024	20	15	09.968	-21	21	49.06	1.3329457	0.4651963	5.05	-0.3	35.5
02/07/2024	20	21	43.582	-21	05	23.81	1.3400919	0.4641419	5.02	-0.4	34.4
02/08/2024	20	28	18.646	-20	47	37.77	1.3467882	0.4628112	5.00	-0.4	33.2
02/09/2024	20	34	55.053	-20	28	30.55	1.3530324	0.4612056	4.97	-0.4	32.1
02/10/2024	20	41	32.706	-20	08	01.77	1.3588215	0.4593272	4.95	-0.5	30.9
02/11/2024	20	48	11.521	-19	46	11.09	1.3641514	0.4571783	4.93	-0.5	29.8
02/12/2024	20	54	51.427	-19	22	58.23	1.3690167	0.4547618	4.92	-0.5	28.6
02/13/2024	21	01	32.366	-18	58	22.92	1.3734110	0.4520809	4.90	-0.6	27.3
02/14/2024	21	08	14.290	-18	32	24.95	1.3773264	0.4491395	4.89	-0.6	26.1
02/15/2024	21	14	57.163	-18	05	04.14	1.3807537	0.4459420	4.87	-0.7	24.8
02/16/2024	21	21	40.954	-17	36	20.36	1.3836819	0.4424937	4.86	-0.7	23.4
02/17/2024	21	28	25.644	-17	06	13.54	1.3860984	0.4388003	4.86	-0.8	22.1
02/18/2024	21	35	11.217	-16	34	43.64	1.3879886	0.4348686	4.85	-0.8	20.6

## 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		
02/19/2024	21	41	57.666	-16	01	50.68	1.3893360	0.4307062	4.84	-0.9	19.1
02/20/2024	21	48	44.986	-15	27	34.76	1.3901221	0.4263217	4.84	-1.0	17.6
02/21/2024	21	55	33.179	-14	51	56.03	1.3903259	0.4217250	4.84	-1.1	16.0
02/22/2024	22	02	22.249	-14	14	54.76	1.3899244	0.4169272	4.84	-1.2	14.4
02/23/2024	22	09	12.201	-13	36	31.31	1.3888917	0.4119409	4.85	-1.3	12.8
02/24/2024	22	16	03.037	-12	56	46.20	1.3871999	0.4067802	4.85	-1.4	11.1
02/25/2024	22	22	54.757	-12	15	40.09	1.3848180	0.4014612	4.86	-1.5	9.3
02/26/2024	22	29	47.353	-11	33	13.86	1.3817126	0.3960018	4.87	-1.6	7.7
02/27/2024	22	36	40.806	-10	49	28.61	1.3778476	0.3904222	4.88	-1.7	6.1
02/28/2024	22	43	35.083	-10	04	25.72	1.3731842	0.3847448	4.90	-1.8	5.0
02/29/2024	22	50	30.127	-09	18	06.94	1.3676812	0.3789947	4.92	-1.8	4.8
03/01/2024	22	57	25.857	-08	30	34.40	1.3612952	0.3731999	4.94	-1.8	5.7
03/02/2024	23	04	22.158	-07	41	50.69	1.3539810	0.3673913	4.97	-1.8	7.4
03/03/2024	23	11	18.873	-06	51	58.96	1.3456920	0.3616029	5.00	-1.8	9.6
03/04/2024	23	18	15.792	-06	01	03.02	1.3363809	0.3558718	5.04	-1.7	12.2
03/05/2024	23	25	12.648	-05	09	07.38	1.3260009	0.3502384	5.08	-1.7	15.0
03/06/2024	23	32	09.100	-04	16	17.40	1.3145065	0.3447464	5.12	-1.6	18.0
03/07/2024	23	39	04.726	-03	22	39.36	1.3018555	0.3394423	5.17	-1.6	21.1
03/08/2024	23	45	59.011	-02	28	20.57	1.2880101	0.3343750	5.23	-1.5	24.5
03/09/2024	23	52	51.333	-01	33	29.45	1.2729397	0.3295956	5.29	-1.5	28.1
03/10/2024	23	59	40.962	-00	38	15.57	1.2566223	0.3251562	5.36	-1.4	31.8
03/11/2024	00	06	27.044	00	17	10.28	1.2390479	0.3211090	5.43	-1.4	35.6
03/12/2024	00	13	08.597	01	12	36.12	1.2202201	0.3175051	5.52	-1.3	39.7
03/13/2024	00	19	44.516	02	07	48.78	1.2001587	0.3143930	5.61	-1.3	43.9
03/14/2024	00	26	13.566	03	02	34.06	1.1789020	0.3118169	5.71	-1.2	48.2
03/15/2024	00	32	34.397	03	56	36.86	1.1565076	0.3098154	5.82	-1.2	52.6
03/16/2024	00	38	45.558	04	49	41.34	1.1330535	0.3084193	5.94	-1.1	57.2
03/17/2024	00	44	45.517	05	41	31.28	1.1086376	0.3076512	6.07	-1.1	61.8
03/18/2024	00	50	32.685	06	31	50.26	1.0833768	0.3075233	6.21	-1.0	66.5
03/19/2024	00	56	05.447	07	20	22.01	1.0574048	0.3080378	6.36	-0.9	71.3
03/20/2024	01	01	22.188	08	06	50.69	1.0308688	0.3091864	6.53	-0.8	76.0
03/21/2024	01	06	21.328	08	51	01.12	1.0039267	0.3109505	6.70	-0.7	80.8
03/22/2024	01	11	01.343	09	32	38.96	0.9767427	0.3133025	6.89	-0.6	85.6
03/23/2024	01	15	20.798	10	11	30.91	0.9494839	0.3162066	7.09	-0.5	90.4
03/24/2024	01	19	18.367	10	47	24.71	0.9223164	0.3196208	7.30	-0.3	95.1
03/25/2024	01	22	52.851	11	20	09.26	0.8954023	0.3234981	7.52	-0.2	99.8
03/26/2024	01	26	03.204	11	49	34.55	0.8688971	0.3277881	7.75	-0.0	104.4
03/27/2024	01	28	48.543	12	15	31.67	0.8429480	0.3324390	7.98	0.2	109.0
03/28/2024	01	31	08.174	12	37	52.80	0.8176925	0.3373984	8.23	0.4	113.6
03/29/2024	01	33	01.605	12	56	31.16	0.7932576	0.3426148	8.48	0.6	118.2
03/30/2024	01	34	28.570	13	11	21.13	0.7697597	0.3480382	8.74	0.9	122.7
03/31/2024	01	35	29.051	13	22	18.27	0.7473044	0.3536212	9.01	1.2	127.1
04/01/2024	01	36	03.302	13	29	19.53	0.7259867	0.3593189	9.27	1.5	131.6
04/02/2024	01	36	11.872	13	32	23.44	0.7058913	0.3650896	9.53	1.8	136.0
04/03/2024	01	35	55.625	13	31	30.42	0.6870929	0.3708948	9.79	2.2	140.4
04/04/2024	01	35	15.756	13	26	43.06	0.6696560	0.3766993	10.05	2.6	144.8
04/05/2024	01	34	13.803	13	18	06.49	0.6536354	0.3824710	10.30	3.0	149.1
04/06/2024	01	32	51.639	13	05	48.70	0.6390760	0.3881807	10.53	3.5	153.4
04/07/2024	01	31	11.464	12	50	00.78	0.6260122	0.3938022	10.75	4.0	157.7
04/08/2024	01	29	15.773	12	30	57.14	0.6144687	0.3993122	10.95	4.5	161.9

## 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		
04/09/2024	01	27	07.312	12	08	55.49	0.6044591	0.4046894	11.13	5.0	166.0
04/10/2024	01	24	49.022	11	44	16.76	0.5959870	0.4099150	11.29	5.6	169.8
04/11/2024	01	22	23.972	11	17	24.72	0.5890449	0.4149725	11.43	6.1	173.1
04/12/2024	01	19	55.278	10	48	45.54	0.5836152	0.4198468	11.53	6.3	174.8
04/13/2024	01	17	26.030	10	18	47.12	0.5796701	0.4245247	11.61	6.1	173.5
04/14/2024	01	14	59.214	09	47	58.28	0.5771724	0.4289947	11.66	5.7	170.6
04/15/2024	01	12	37.638	09	16	48.01	0.5760764	0.4332464	11.68	5.2	167.1
04/16/2024	01	10	23.878	08	45	44.58	0.5763291	0.4372706	11.68	4.7	163.5
04/17/2024	01	08	20.230	08	15	14.85	0.5778712	0.4410594	11.65	4.3	159.9
04/18/2024	01	06	28.675	07	45	43.56	0.5806387	0.4446057	11.59	3.9	156.4
04/19/2024	01	04	50.874	07	17	32.92	0.5845646	0.4479033	11.51	3.5	153.0
04/20/2024	01	03	28.159	06	51	02.24	0.5895799	0.4509468	11.41	3.2	149.6
04/21/2024	01	02	21.549	06	26	27.79	0.5956148	0.4537314	11.30	2.9	146.4
04/22/2024	01	01	31.771	06	04	02.80	0.6026003	0.4562532	11.17	2.6	143.2
04/23/2024	01	00	59.289	05	43	57.57	0.6104691	0.4585086	11.02	2.4	140.2
04/24/2024	01	00	44.334	05	26	19.65	0.6191559	0.4604946	10.87	2.1	137.3
04/25/2024	01	00	46.938	05	11	14.15	0.6285985	0.4622086	10.71	1.9	134.4
04/26/2024	01	01	06.970	04	58	43.98	0.6387383	0.4636486	10.54	1.8	131.7
04/27/2024	01	01	44.166	04	48	50.21	0.6495201	0.4648127	10.36	1.6	129.1
04/28/2024	01	02	38.159	04	41	32.33	0.6608927	0.4656996	10.18	1.5	126.5
04/29/2024	01	03	48.504	04	36	48.56	0.6728085	0.4663084	10.00	1.3	124.1
04/30/2024	01	05	14.704	04	34	36.10	0.6852242	0.4666383	9.82	1.2	121.7
05/01/2024	01	06	56.228	04	34	51.36	0.6980997	0.4666889	9.64	1.1	119.4
05/02/2024	01	08	52.530	04	37	30.12	0.7113986	0.4664603	9.46	1.0	117.2
05/03/2024	01	11	03.059	04	42	27.78	0.7250881	0.4659526	9.28	0.9	115.0
05/04/2024	01	13	27.275	04	49	39.41	0.7391379	0.4651664	9.11	0.8	112.8
05/05/2024	01	16	04.657	04	58	59.91	0.7535212	0.4641027	8.93	0.8	110.7
05/06/2024	01	18	54.708	05	10	24.09	0.7682133	0.4627626	8.76	0.7	108.7
05/07/2024	01	21	56.962	05	23	46.76	0.7831921	0.4611478	8.59	0.6	106.6
05/08/2024	01	25	10.985	05	39	02.74	0.7984373	0.4592603	8.43	0.6	104.6
05/09/2024	01	28	36.382	05	56	06.89	0.8139307	0.4571024	8.27	0.5	102.6
05/10/2024	01	32	12.794	06	14	54.21	0.8296554	0.4546769	8.11	0.5	100.6
05/11/2024	01	35	59.905	06	35	19.76	0.8455956	0.4519873	7.96	0.4	98.7
05/12/2024	01	39	57.439	06	57	18.72	0.8617364	0.4490373	7.81	0.3	96.7
05/13/2024	01	44	05.163	07	20	46.40	0.8780635	0.4458315	7.66	0.3	94.8
05/14/2024	01	48	22.886	07	45	38.18	0.8945628	0.4423751	7.52	0.2	92.8
05/15/2024	01	52	50.458	08	11	49.55	0.9112202	0.4386738	7.39	0.2	90.9
05/16/2024	01	57	27.768	08	39	16.09	0.9280214	0.4347345	7.25	0.1	88.9
05/17/2024	02	02	14.748	09	07	53.39	0.9449512	0.4305648	7.12	0.1	86.9
05/18/2024	02	07	11.366	09	37	37.11	0.9619936	0.4261734	7.00	0.0	84.9
05/19/2024	02	12	17.627	10	08	22.89	0.9791316	0.4215702	6.87	-0.0	82.9
05/20/2024	02	17	33.574	10	40	06.36	0.9963461	0.4167663	6.75	-0.1	80.9
05/21/2024	02	22	59.281	11	12	43.07	1.0136164	0.4117744	6.64	-0.1	78.8
05/22/2024	02	28	34.856	11	46	08.52	1.0309193	0.4066087	6.53	-0.2	76.6
05/23/2024	02	34	20.440	12	20	18.03	1.0482289	0.4012853	6.42	-0.3	74.5
05/24/2024	02	40	16.196	12	55	06.78	1.0655161	0.3958221	6.32	-0.3	72.2
05/25/2024	02	46	22.314	13	30	29.70	1.0827479	0.3902394	6.22	-0.4	69.9
05/26/2024	02	52	39.004	14	06	21.48	1.0998874	0.3845597	6.12	-0.4	67.5
05/27/2024	02	59	06.491	14	42	36.45	1.1168931	0.3788084	6.03	-0.5	65.1
05/28/2024	03	05	45.009	15	19	08.57	1.1337184	0.3730132	5.94	-0.6	62.5

## 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.
05/29/2024	03 12 34.795	15 55 51.38	1.1503112	0.3672053	5.85	-0.6	59.9
05/30/2024	03 19 36.081	16 32 37.92	1.1666137	0.3614187	5.77	-0.7	57.2
05/31/2024	03 26 49.081	17 09 20.68	1.1825618	0.3556906	5.69	-0.8	54.3
06/01/2024	03 34 13.981	17 45 51.57	1.1980853	0.3500617	5.62	-0.9	51.4
06/02/2024	03 41 50.926	18 22 01.90	1.2131079	0.3445755	5.55	-1.0	48.3
06/03/2024	03 49 39.997	18 57 42.29	1.2275473	0.3392786	5.48	-1.0	45.0
06/04/2024	03 57 41.199	19 32 42.76	1.2413159	0.3342201	5.42	-1.1	41.7
06/05/2024	04 05 54.437	20 06 52.65	1.2543220	0.3294510	5.37	-1.2	38.2
06/06/2024	04 14 19.499	20 40 00.77	1.2664708	0.3250234	5.31	-1.3	34.6
06/07/2024	04 22 56.035	21 11 55.43	1.2776663	0.3209895	5.27	-1.4	30.8
06/08/2024	04 31 43.541	21 42 24.62	1.2878137	0.3174003	5.23	-1.6	26.9
06/09/2024	04 40 41.349	22 11 16.19	1.2968220	0.3143041	5.19	-1.7	23.0
06/10/2024	04 49 48.615	22 38 18.07	1.3046066	0.3117452	5.16	-1.8	18.9
06/11/2024	04 59 04.323	23 03 18.61	1.3110930	0.3097616	5.13	-2.0	14.9
06/12/2024	05 08 27.288	23 26 06.79	1.3162189	0.3083842	5.11	-2.1	10.8
06/13/2024	05 17 56.177	23 46 32.61	1.3199375	0.3076350	5.10	-2.3	6.8
06/14/2024	05 27 29.533	24 04 27.32	1.3222191	0.3075261	5.09	-2.4	3.6
06/15/2024	05 37 05.806	24 19 43.69	1.3230527	0.3080594	5.09	-2.4	3.9
06/16/2024	05 46 43.393	24 32 16.20	1.3224462	0.3092261	5.09	-2.2	7.3
06/17/2024	05 56 20.680	24 42 01.16	1.3204258	0.3110076	5.10	-2.0	11.2
06/18/2024	06 05 56.081	24 48 56.74	1.3170346	0.3133759	5.11	-1.9	15.1
06/19/2024	06 15 28.073	24 53 02.92	1.3123306	0.3162952	5.13	-1.7	18.9
06/20/2024	06 24 55.231	24 54 21.39	1.3063838	0.3197232	5.15	-1.6	22.7
06/21/2024	06 34 16.250	24 52 55.38	1.2992735	0.3236127	5.18	-1.4	26.4
06/22/2024	06 43 29.960	24 48 49.45	1.2910850	0.3279135	5.21	-1.3	30.0
06/23/2024	06 52 35.337	24 42 09.24	1.2819075	0.3325737	5.25	-1.2	33.4
06/24/2024	07 01 31.506	24 33 01.27	1.2718307	0.3375409	5.29	-1.1	36.7
06/25/2024	07 10 17.732	24 21 32.74	1.2609434	0.3427636	5.34	-1.0	39.8
06/26/2024	07 18 53.420	24 07 51.26	1.2493315	0.3481921	5.39	-0.9	42.9
06/27/2024	07 27 18.098	23 52 04.75	1.2370768	0.3537788	5.44	-0.8	45.8
06/28/2024	07 35 31.407	23 34 21.25	1.2242562	0.3594790	5.50	-0.7	48.6
06/29/2024	07 43 33.084	23 14 48.84	1.2109411	0.3652512	5.56	-0.6	51.3
06/30/2024	07 51 22.951	22 53 35.53	1.1971970	0.3710570	5.62	-0.6	53.8
07/01/2024	07 59 00.898	22 30 49.18	1.1830839	0.3768611	5.69	-0.5	56.3
07/02/2024	08 06 26.870	22 06 37.47	1.1686558	0.3826315	5.76	-0.5	58.6
07/03/2024	08 13 40.856	21 41 07.86	1.1539616	0.3883393	5.83	-0.4	60.9
07/04/2024	08 20 42.880	21 14 27.57	1.1390449	0.3939583	5.91	-0.3	63.0
07/05/2024	08 27 32.988	20 46 43.57	1.1239448	0.3994650	5.99	-0.3	65.1
07/06/2024	08 34 11.245	20 18 02.57	1.1086959	0.4048385	6.07	-0.2	67.1
07/07/2024	08 40 37.724	19 48 31.04	1.0933292	0.4100600	6.16	-0.2	69.1
07/08/2024	08 46 52.504	19 18 15.21	1.0778721	0.4151128	6.24	-0.2	70.9
07/09/2024	08 52 55.663	18 47 21.11	1.0623487	0.4199822	6.34	-0.1	72.8
07/10/2024	08 58 47.271	18 15 54.55	1.0467807	0.4246548	6.43	-0.1	74.5
07/11/2024	09 04 27.390	17 44 01.18	1.0311873	0.4291192	6.53	-0.0	76.3
07/12/2024	09 09 56.067	17 11 46.51	1.0155857	0.4333649	6.63	-0.0	78.0
07/13/2024	09 15 13.333	16 39 15.93	0.9999915	0.4373829	6.73	0.0	79.7
07/14/2024	09 20 19.195	16 06 34.71	0.9844187	0.4411653	6.84	0.1	81.3
07/15/2024	09 25 13.641	15 33 48.07	0.9688803	0.4447049	6.95	0.1	83.0
07/16/2024	09 29 56.631	15 01 01.18	0.9533887	0.4479956	7.06	0.1	84.6
07/17/2024	09 34 28.096	14 28 19.21	0.9379554	0.4510320	7.18	0.2	86.2

## 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		
07/18/2024	09	38	47.940	13	55	47.32	0.9225917	0.4538095	7.29	0.2	87.9
07/19/2024	09	42	56.033	13	23	30.73	0.9073090	0.4563239	7.42	0.2	89.5
07/20/2024	09	46	52.213	12	51	34.70	0.8921187	0.4585717	7.54	0.3	91.2
07/21/2024	09	50	36.282	12	20	04.62	0.8770328	0.4605499	7.67	0.3	92.9
07/22/2024	09	54	08.011	11	49	05.96	0.8620637	0.4622560	7.81	0.3	94.7
07/23/2024	09	57	27.131	11	18	44.37	0.8472248	0.4636879	7.94	0.4	96.4
07/24/2024	10	00	33.340	10	49	05.65	0.8325307	0.4648439	8.08	0.4	98.3
07/25/2024	10	03	26.303	10	20	15.81	0.8179972	0.4657226	8.23	0.5	100.1
07/26/2024	10	06	05.645	09	52	21.10	0.8036418	0.4663230	8.37	0.5	102.1
07/27/2024	10	08	30.960	09	25	28.03	0.7894839	0.4666444	8.52	0.6	104.1
07/28/2024	10	10	41.806	08	59	43.42	0.7755452	0.4666864	8.68	0.6	106.1
07/29/2024	10	12	37.711	08	35	14.40	0.7618499	0.4664491	8.83	0.7	108.2
07/30/2024	10	14	18.176	08	12	08.43	0.7484252	0.4659326	8.99	0.8	110.4
07/31/2024	10	15	42.684	07	50	33.29	0.7353017	0.4651377	9.15	0.8	112.7
08/01/2024	10	16	50.712	07	30	37.08	0.7225135	0.4640651	9.31	0.9	115.1
08/02/2024	10	17	41.736	07	12	28.15	0.7100990	0.4627161	9.48	1.0	117.5
08/03/2024	10	18	15.255	06	56	15.08	0.6981006	0.4610923	9.64	1.1	120.1
08/04/2024	10	18	30.810	06	42	06.58	0.6865658	0.4591958	9.80	1.3	122.7
08/05/2024	10	18	28.002	06	30	11.34	0.6755468	0.4570290	9.96	1.4	125.4
08/06/2024	10	18	06.526	06	20	37.95	0.6651012	0.4545946	10.12	1.6	128.2
08/07/2024	10	17	26.202	06	13	34.60	0.6552918	0.4518961	10.27	1.7	131.2
08/08/2024	10	16	27.007	06	09	08.90	0.6461868	0.4489373	10.41	1.9	134.2
08/09/2024	10	15	09.122	06	07	27.56	0.6378594	0.4457228	10.55	2.1	137.3
08/10/2024	10	13	32.970	06	08	36.00	0.6303879	0.4422578	10.68	2.4	140.6
08/11/2024	10	11	39.259	06	12	38.03	0.6238547	0.4385481	10.79	2.6	143.9
08/12/2024	10	09	29.021	06	19	35.38	0.6183457	0.4346005	10.88	2.9	147.3
08/13/2024	10	07	03.651	06	29	27.32	0.6139493	0.4304228	10.96	3.3	150.8
08/14/2024	10	04	24.930	06	42	10.22	0.6107548	0.4260237	11.02	3.6	154.3
08/15/2024	10	01	35.037	06	57	37.33	0.6088508	0.4214132	11.05	4.0	157.8
08/16/2024	09	58	36.548	07	15	38.44	0.6083236	0.4166023	11.06	4.4	161.2
08/17/2024	09	55	32.410	07	35	59.91	0.6092549	0.4116039	11.05	4.8	164.4
08/18/2024	09	52	25.899	07	58	24.70	0.6117196	0.4064322	11.00	5.1	166.9
08/19/2024	09	49	20.550	08	22	32.66	0.6157838	0.4011034	10.93	5.3	168.4
08/20/2024	09	46	20.081	08	48	01.00	0.6215028	0.3956355	10.83	5.3	168.3
08/21/2024	09	43	28.288	09	14	24.84	0.6289191	0.3900489	10.70	5.0	166.5
08/22/2024	09	40	48.946	09	41	18.00	0.6380611	0.3843662	10.55	4.6	163.5
08/23/2024	09	38	25.697	10	08	13.67	0.6489422	0.3786127	10.37	4.1	159.8
08/24/2024	09	36	21.959	10	34	45.19	0.6615595	0.3728166	10.17	3.6	155.6
08/25/2024	09	34	40.833	11	00	26.70	0.6758941	0.3670088	9.96	3.1	151.2
08/26/2024	09	33	25.040	11	24	53.65	0.6919106	0.3612236	9.73	2.7	146.6
08/27/2024	09	32	36.873	11	47	43.18	0.7095575	0.3554984	9.48	2.2	141.9
08/28/2024	09	32	18.167	12	08	34.41	0.7287669	0.3498738	9.23	1.8	137.0
08/29/2024	09	32	30.287	12	27	08.55	0.7494555	0.3443935	8.98	1.4	132.1
08/30/2024	09	33	14.135	12	43	08.95	0.7715244	0.3391043	8.72	1.1	127.1
08/31/2024	09	34	30.158	12	56	21.12	0.7948597	0.3340551	8.47	0.8	122.0
09/01/2024	09	36	18.373	13	06	32.64	0.8193330	0.3292970	8.21	0.5	116.9
09/02/2024	09	38	38.389	13	13	33.19	0.8448018	0.3248823	7.97	0.2	111.7
09/03/2024	09	41	29.441	13	17	14.45	0.8711110	0.3208629	7.73	0.0	106.5
09/04/2024	09	44	50.420	13	17	30.20	0.8980935	0.3172899	7.49	-0.2	101.3
09/05/2024	09	48	39.907	13	14	16.25	0.9255731	0.3142114	7.27	-0.4	96.0

## 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		
09/06/2024	09	52	56.211	13	07	30.58	0.9533660	0.3116714	7.06	-0.5	90.8
09/07/2024	09	57	37.410	12	57	13.30	0.9812848	0.3097078	6.86	-0.6	85.5
09/08/2024	10	02	41.396	12	43	26.70	1.0091416	0.3083510	6.67	-0.7	80.3
09/09/2024	10	08	05.926	12	26	15.24	1.0367523	0.3076228	6.49	-0.8	75.2
09/10/2024	10	13	48.675	12	05	45.43	1.0639407	0.3075350	6.33	-0.9	70.1
09/11/2024	10	19	47.285	11	42	05.73	1.0905425	0.3080890	6.17	-1.0	65.2
09/12/2024	10	25	59.424	11	15	26.24	1.1164089	0.3092758	6.03	-1.0	60.3
09/13/2024	10	32	22.832	10	45	58.52	1.1414094	0.3110764	5.90	-1.1	55.6
09/14/2024	10	38	55.366	10	13	55.17	1.1654339	0.3134625	5.77	-1.1	51.1
09/15/2024	10	45	35.036	09	39	29.55	1.1883932	0.3163982	5.66	-1.2	46.7
09/16/2024	10	52	20.027	09	02	55.41	1.2102195	0.3198409	5.56	-1.2	42.5
09/17/2024	10	59	08.723	08	24	26.54	1.2308653	0.3237434	5.47	-1.2	38.5
09/18/2024	11	05	59.708	07	44	16.54	1.2503013	0.3280555	5.38	-1.3	34.6
09/19/2024	11	12	51.768	07	02	38.53	1.2685151	0.3327252	5.31	-1.3	31.0
09/20/2024	11	19	43.882	06	19	45.04	1.2855082	0.3377002	5.24	-1.3	27.6
09/21/2024	11	26	35.205	05	35	47.84	1.3012939	0.3429291	5.17	-1.4	24.3
09/22/2024	11	33	25.058	04	50	57.86	1.3158949	0.3483622	5.11	-1.4	21.2
09/23/2024	11	40	12.902	04	05	25.22	1.3293410	0.3539521	5.06	-1.4	18.3
09/24/2024	11	46	58.328	03	19	19.14	1.3416671	0.3596542	5.02	-1.5	15.6
09/25/2024	11	53	41.037	02	32	47.99	1.3529120	0.3654270	4.97	-1.5	13.0
09/26/2024	12	00	20.824	01	45	59.35	1.3631160	0.3712323	4.94	-1.6	10.7
09/27/2024	12	06	57.564	00	59	00.00	1.3723209	0.3770349	4.90	-1.6	8.5
09/28/2024	12	13	31.198	00	11	56.06	1.3805681	0.3828030	4.87	-1.7	6.5
09/29/2024	12	20	01.721	-00	35	07.05	1.3878983	0.3885076	4.85	-1.7	4.8
09/30/2024	12	26	29.175	-01	22	04.44	1.3943511	0.3941228	4.83	-1.7	3.6
10/01/2024	12	32	53.633	-02	08	51.77	1.3999641	0.3996252	4.81	-1.7	3.3
10/02/2024	12	39	15.197	-02	55	25.17	1.4047733	0.4049938	4.79	-1.6	4.0
10/03/2024	12	45	33.991	-03	41	41.16	1.4088122	0.4102099	4.78	-1.5	5.2
10/04/2024	12	51	50.154	-04	27	36.64	1.4121124	0.4152569	4.77	-1.4	6.5
10/05/2024	12	58	03.836	-05	13	08.81	1.4147031	0.4201201	4.76	-1.3	7.9
10/06/2024	13	04	15.191	-05	58	15.14	1.4166112	0.4247864	4.75	-1.3	9.4
10/07/2024	13	10	24.383	-06	42	53.36	1.4178614	0.4292441	4.75	-1.2	10.8
10/08/2024	13	16	31.572	-07	27	01.37	1.4184765	0.4334829	4.74	-1.1	12.1
10/09/2024	13	22	36.921	-08	10	37.28	1.4184769	0.4374939	4.74	-1.0	13.5
10/10/2024	13	28	40.588	-08	53	39.31	1.4178811	0.4412690	4.75	-0.9	14.8
10/11/2024	13	34	42.729	-09	36	05.84	1.4167060	0.4448013	4.75	-0.9	16.1
10/12/2024	13	40	43.497	-10	17	55.34	1.4149665	0.4480846	4.76	-0.8	17.4
10/13/2024	13	46	43.036	-10	59	06.36	1.4126757	0.4511135	4.76	-0.8	18.7
10/14/2024	13	52	41.487	-11	39	37.55	1.4098454	0.4538833	4.77	-0.7	20.0
10/15/2024	13	58	38.986	-12	19	27.59	1.4064857	0.4563900	4.78	-0.7	21.2
10/16/2024	14	04	35.660	-12	58	35.24	1.4026053	0.4586301	4.80	-0.6	22.5
10/17/2024	14	10	31.631	-13	36	59.31	1.3982115	0.4606006	4.81	-0.6	23.7
10/18/2024	14	16	27.010	-14	14	38.61	1.3933101	0.4622990	4.83	-0.5	25.0
10/19/2024	14	22	21.899	-14	51	32.00	1.3879057	0.4637231	4.85	-0.5	26.2
10/20/2024	14	28	16.384	-15	27	38.31	1.3820017	0.4648713	4.87	-0.5	27.5
10/21/2024	14	34	10.540	-16	02	56.38	1.3756003	0.4657422	4.89	-0.4	28.7
10/22/2024	14	40	04.425	-16	37	25.00	1.3687026	0.4663349	4.92	-0.4	30.0
10/23/2024	14	45	58.083	-17	11	02.98	1.3613087	0.4666485	4.94	-0.4	31.2
10/24/2024	14	51	51.542	-17	43	49.06	1.3534177	0.4666829	4.97	-0.4	32.5
10/25/2024	14	57	44.813	-18	15	41.98	1.3450280	0.4664378	5.00	-0.3	33.8

## 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		
10/26/2024	15	03	37.889	-18	46	40.45	1.3361372	0.4659137	5.04	-0.3	35.0
10/27/2024	15	09	30.741	-19	16	43.14	1.3267420	0.4651111	5.07	-0.3	36.3
10/28/2024	15	15	23.319	-19	45	48.70	1.3168388	0.4640309	5.11	-0.3	37.6
10/29/2024	15	21	15.548	-20	13	55.73	1.3064229	0.4626744	5.15	-0.3	39.0
10/30/2024	15	27	07.325	-20	41	02.81	1.2954895	0.4610432	5.19	-0.3	40.3
10/31/2024	15	32	58.515	-21	07	08.47	1.2840332	0.4591392	5.24	-0.3	41.7
11/01/2024	15	38	48.952	-21	32	11.20	1.2720482	0.4569650	5.29	-0.3	43.1
11/02/2024	15	44	38.428	-21	56	09.45	1.2595284	0.4545233	5.34	-0.3	44.5
11/03/2024	15	50	26.696	-22	19	01.63	1.2464677	0.4518176	5.40	-0.3	46.0
11/04/2024	15	56	13.460	-22	40	46.12	1.2328598	0.4488517	5.46	-0.3	47.5
11/05/2024	16	01	58.371	-23	01	21.24	1.2186987	0.4456302	5.52	-0.3	49.0
11/06/2024	16	07	41.022	-23	20	45.30	1.2039787	0.4421582	5.59	-0.3	50.7
11/07/2024	16	13	20.939	-23	38	56.55	1.1886947	0.4384417	5.66	-0.3	52.4
11/08/2024	16	18	57.576	-23	55	53.20	1.1728424	0.4344875	5.74	-0.3	54.1
11/09/2024	16	24	30.303	-24	11	33.46	1.1564188	0.4303034	5.82	-0.3	56.0
11/10/2024	16	29	58.399	-24	25	55.49	1.1394223	0.4258980	5.91	-0.3	57.9
11/11/2024	16	35	21.041	-24	38	57.42	1.1218535	0.4212813	6.00	-0.4	60.0
11/12/2024	16	40	37.289	-24	50	37.39	1.1037158	0.4164647	6.10	-0.4	62.1
11/13/2024	16	45	46.076	-25	00	53.52	1.0850156	0.4114607	6.20	-0.4	64.4
11/14/2024	16	50	46.187	-25	09	43.91	1.0657636	0.4062839	6.31	-0.4	66.8
11/15/2024	16	55	36.248	-25	17	06.65	1.0459755	0.4009502	6.43	-0.4	69.4
11/16/2024	17	00	14.702	-25	22	59.83	1.0256733	0.3954780	6.56	-0.4	72.1
11/17/2024	17	04	39.791	-25	27	21.49	1.0048864	0.3898875	6.70	-0.4	75.0
11/18/2024	17	08	49.542	-25	30	09.59	0.9836535	0.3842016	6.84	-0.4	78.1
11/19/2024	17	12	41.745	-25	31	22.02	0.9620245	0.3784456	7.00	-0.4	81.4
11/20/2024	17	16	13.947	-25	30	56.55	0.9400622	0.3726477	7.16	-0.3	85.0
11/21/2024	17	19	23.446	-25	28	50.78	0.9178454	0.3668390	7.33	-0.3	88.7
11/22/2024	17	22	07.297	-25	25	02.07	0.8954712	0.3610540	7.52	-0.2	92.7
11/23/2024	17	24	22.336	-25	19	27.55	0.8730580	0.3553300	7.71	-0.2	97.0
11/24/2024	17	26	05.231	-25	12	03.99	0.8507486	0.3497080	7.91	-0.1	101.6
11/25/2024	17	27	12.566	-25	02	47.82	0.8287127	0.3442316	8.12	0.1	106.5
11/26/2024	17	27	40.974	-24	51	35.13	0.8071494	0.3389478	8.34	0.2	111.7
11/27/2024	17	27	27.323	-24	38	21.86	0.7862889	0.3339057	8.56	0.5	117.2
11/28/2024	17	26	28.970	-24	23	04.08	0.7663917	0.3291565	8.78	0.7	123.1
11/29/2024	17	24	44.084	-24	05	38.61	0.7477470	0.3247524	9.00	1.1	129.3
11/30/2024	17	22	12.018	-23	46	03.97	0.7306671	0.3207455	9.21	1.5	135.9
12/01/2024	17	18	53.705	-23	24	21.73	0.7154781	0.3171867	9.41	2.1	142.7
12/02/2024	17	14	52.027	-23	00	38.18	0.7025073	0.3141243	9.58	2.8	149.9
12/03/2024	17	10	12.061	-22	35	06.16	0.6920655	0.3116018	9.72	3.5	157.2
12/04/2024	17	05	01.136	-22	08	06.62	0.6844278	0.3096571	9.83	4.5	164.7
12/05/2024	16	59	28.612	-21	40	09.46	0.6798126	0.3083203	9.90	5.4	171.9
12/06/2024	16	53	45.367	-21	11	53.04	0.6783631	0.3076129	9.92	6.0	175.5
12/07/2024	16	48	03.032	-20	44	02.14	0.6801342	0.3075462	9.90	5.2	170.0
12/08/2024	16	42	33.096	-20	17	24.56	0.6850870	0.3081214	9.82	4.2	162.7
12/09/2024	16	37	26.043	-19	52	46.82	0.6930918	0.3093290	9.71	3.3	155.2
12/10/2024	16	32	50.658	-19	30	50.02	0.7039400	0.3111496	9.56	2.5	147.9
12/11/2024	16	28	53.615	-19	12	06.52	0.7173611	0.3135547	9.38	1.9	140.7
12/12/2024	16	25	39.352	-18	56	58.10	0.7330437	0.3165079	9.18	1.4	133.9
12/13/2024	16	23	10.201	-18	45	35.58	0.7506552	0.3199667	8.97	1.0	127.4
12/14/2024	16	21	26.690	-18	37	59.72	0.7698607	0.3238836	8.74	0.6	121.3

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		
12/15/2024	16	20	27.922	-18	34	02.99	0.7903366	0.3282083	8.52	0.4	115.4
12/16/2024	16	20	11.968	-18	33	31.52	0.8117815	0.3328887	8.29	0.1	110.0
12/17/2024	16	20	36.228	-18	36	07.23	0.8339223	0.3378726	8.07	-0.0	104.9
12/18/2024	16	21	37.721	-18	41	29.56	0.8565173	0.3431087	7.86	-0.1	100.1
12/19/2024	16	23	13.314	-18	49	16.93	0.8793567	0.3485473	7.65	-0.2	95.6
12/20/2024	16	25	19.888	-18	59	07.84	0.9022618	0.3541411	7.46	-0.3	91.4
12/21/2024	16	27	54.442	-19	10	41.57	0.9250828	0.3598456	7.28	-0.3	87.4
12/22/2024	16	30	54.164	-19	23	38.67	0.9476955	0.3656195	7.10	-0.4	83.8
12/23/2024	16	34	16.467	-19	37	41.21	0.9699987	0.3714246	6.94	-0.4	80.3
12/24/2024	16	37	59.000	-19	52	32.85	0.9919111	0.3772260	6.78	-0.4	77.1
12/25/2024	16	41	59.649	-20	07	58.92	1.0133683	0.3829918	6.64	-0.4	74.0
12/26/2024	16	46	16.526	-20	23	46.26	1.0343202	0.3886933	6.51	-0.4	71.1
12/27/2024	16	50	47.952	-20	39	43.20	1.0547287	0.3943045	6.38	-0.4	68.4
12/28/2024	16	55	32.440	-20	55	39.38	1.0745654	0.3998022	6.26	-0.4	65.9
12/29/2024	17	00	28.678	-21	11	25.63	1.0938105	0.4051655	6.15	-0.4	63.5
12/30/2024	17	05	35.502	-21	26	53.85	1.1124505	0.4103758	6.05	-0.4	61.2
12/31/2024	17	10	51.889	-21	41	56.90	1.1304774	0.4154166	5.95	-0.3	59.0
01/01/2025	17	16	16.932	-21	56	28.45	1.1478875	0.4202731	5.86	-0.3	56.9



Venus - 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		
12/31/2023	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
01/03/2024	16 13 51.835	-19 16 51.15	1.1944177	0.7206784	13.97	-4.0	55.2
01/04/2024	16 18 55.541	-19 31 28.23	1.2006315	0.7207943	13.90	-4.0	54.8
01/05/2024	16 24 00.379	-19 45 34.92	1.2068157	0.7209123	13.83	-4.0	54.5
01/06/2024	16 29 06.324	-19 59 10.55	1.2129700	0.7210321	13.76	-4.0	54.2
01/07/2024	16 34 13.351	-20 12 14.45	1.2190939	0.7211537	13.69	-4.0	53.8
01/08/2024	16 39 21.431	-20 24 46.00	1.2251873	0.7212770	13.62	-4.0	53.5
01/09/2024	16 44 30.531	-20 36 44.57	1.2312499	0.7214019	13.55	-4.0	53.1
01/10/2024	16 49 40.617	-20 48 09.57	1.2372815	0.7215282	13.49	-4.0	52.8
01/11/2024	16 54 51.649	-20 59 00.40	1.2432821	0.7216560	13.42	-4.0	52.4
01/12/2024	17 00 03.585	-21 09 16.50	1.2492515	0.7217851	13.36	-4.0	52.1
01/13/2024	17 05 16.381	-21 18 57.34	1.2551900	0.7219153	13.30	-4.0	51.7
01/14/2024	17 10 29.996	-21 28 02.38	1.2610976	0.7220467	13.23	-3.9	51.3
01/15/2024	17 15 44.384	-21 36 31.14	1.2669746	0.7221790	13.17	-3.9	50.9
01/16/2024	17 20 59.506	-21 44 23.15	1.2728212	0.7223122	13.11	-3.9	50.5
01/17/2024	17 26 15.318	-21 51 37.98	1.2786378	0.7224462	13.05	-3.9	50.1
01/18/2024	17 31 31.778	-21 58 15.26	1.2844244	0.7225808	12.99	-3.9	49.7
01/19/2024	17 36 48.843	-22 04 14.60	1.2901814	0.7227160	12.93	-3.9	49.3
01/20/2024	17 42 06.464	-22 09 35.69	1.2959088	0.7228517	12.88	-3.9	48.9
01/21/2024	17 47 24.596	-22 14 18.21	1.3016068	0.7229877	12.82	-3.9	48.5
01/22/2024	17 52 43.188	-22 18 21.87	1.3072752	0.7231240	12.77	-3.9	48.2
01/23/2024	17 58 02.189	-22 21 46.42	1.3129142	0.7232604	12.71	-3.9	47.8
01/24/2024	18 03 21.546	-22 24 31.61	1.3185235	0.7233968	12.66	-3.9	47.4
01/25/2024	18 08 41.207	-22 26 37.23	1.3241031	0.7235331	12.60	-3.9	47.0
01/26/2024	18 14 01.118	-22 28 03.10	1.3296528	0.7236693	12.55	-3.9	46.7
01/27/2024	18 19 21.225	-22 28 49.05	1.3351724	0.7238052	12.50	-3.9	46.3
01/28/2024	18 24 41.473	-22 28 54.95	1.3406617	0.7239406	12.45	-3.9	46.0
01/29/2024	18 30 01.809	-22 28 20.70	1.3461203	0.7240756	12.40	-3.9	45.6
01/30/2024	18 35 22.176	-22 27 06.23	1.3515481	0.7242100	12.35	-3.9	45.3
01/31/2024	18 40 42.522	-22 25 11.51	1.3569448	0.7243437	12.30	-3.9	45.0
02/01/2024	18 46 02.791	-22 22 36.53	1.3623100	0.7244765	12.25	-3.9	44.7
02/02/2024	18 51 22.928	-22 19 21.33	1.3676436	0.7246084	12.20	-3.9	44.3
02/03/2024	18 56 42.879	-22 15 25.97	1.3729451	0.7247394	12.16	-3.9	44.0
02/04/2024	19 02 02.590	-22 10 50.56	1.3782143	0.7248692	12.11	-3.9	43.7
02/05/2024	19 07 22.005	-22 05 35.22	1.3834509	0.7249977	12.06	-3.9	43.4
02/06/2024	19 12 41.070	-21 59 40.12	1.3886547	0.7251250	12.02	-3.9	43.1
02/07/2024	19 17 59.729	-21 53 05.47	1.3938253	0.7252508	11.97	-3.9	42.8
02/08/2024	19 23 17.927	-21 45 51.50	1.3989625	0.7253752	11.93	-3.9	42.5
02/09/2024	19 28 35.608	-21 37 58.47	1.4040663	0.7254979	11.89	-3.9	42.2
02/10/2024	19 33 52.721	-21 29 26.65	1.4091365	0.7256189	11.84	-3.9	41.9
02/11/2024	19 39 09.215	-21 20 16.36	1.4141732	0.7257381	11.80	-3.9	41.5
02/12/2024	19 44 25.043	-21 10 27.93	1.4191766	0.7258554	11.76	-3.9	41.2
02/13/2024	19 49 40.165	-21 00 01.71	1.4241468	0.7259708	11.72	-3.9	40.8
02/14/2024	19 54 54.542	-20 48 58.10	1.4290841	0.7260841	11.68	-3.9	40.5
02/15/2024	20 00 08.137	-20 37 17.51	1.4339889	0.7261952	11.64	-3.8	40.1
02/16/2024	20 05 20.917	-20 25 00.41	1.4388614	0.7263041	11.60	-3.8	39.7
02/17/2024	20 10 32.850	-20 12 07.24	1.4437017	0.7264107	11.56	-3.8	39.4
02/18/2024	20 15 43.904	-19 58 38.50	1.4485100	0.7265148	11.52	-3.8	39.0

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		
02/19/2024	20	20	54.053	-19	44	34.69	1.4532864	0.7266165	11.48	-3.8	38.6
02/20/2024	20	26	03.269	-19	29	56.31	1.4580310	0.7267157	11.45	-3.8	38.2
02/21/2024	20	31	11.529	-19	14	43.89	1.4627438	0.7268122	11.41	-3.8	37.9
02/22/2024	20	36	18.812	-18	58	57.97	1.4674246	0.7269059	11.37	-3.8	37.5
02/23/2024	20	41	25.099	-18	42	39.11	1.4720735	0.7269969	11.34	-3.8	37.1
02/24/2024	20	46	30.375	-18	25	47.85	1.4766902	0.7270851	11.30	-3.8	36.7
02/25/2024	20	51	34.626	-18	08	24.78	1.4812747	0.7271703	11.27	-3.8	36.4
02/26/2024	20	56	37.843	-17	50	30.48	1.4858266	0.7272526	11.23	-3.8	36.0
02/27/2024	21	01	40.016	-17	32	05.56	1.4903458	0.7273318	11.20	-3.8	35.7
02/28/2024	21	06	41.140	-17	13	10.63	1.4948320	0.7274079	11.16	-3.8	35.4
02/29/2024	21	11	41.210	-16	53	46.31	1.4992848	0.7274809	11.13	-3.8	35.0
03/01/2024	21	16	40.224	-16	33	53.25	1.5037040	0.7275506	11.10	-3.8	34.7
03/02/2024	21	21	38.181	-16	13	32.10	1.5080891	0.7276171	11.07	-3.8	34.4
03/03/2024	21	26	35.083	-15	52	43.52	1.5124399	0.7276802	11.03	-3.8	34.1
03/04/2024	21	31	30.931	-15	31	28.19	1.5167560	0.7277400	11.00	-3.8	33.8
03/05/2024	21	36	25.729	-15	09	46.79	1.5210368	0.7277964	10.97	-3.8	33.5
03/06/2024	21	41	19.479	-14	47	40.04	1.5252821	0.7278493	10.94	-3.8	33.2
03/07/2024	21	46	12.187	-14	25	08.63	1.5294914	0.7278987	10.91	-3.8	32.9
03/08/2024	21	51	03.859	-14	02	13.29	1.5336643	0.7279446	10.88	-3.8	32.6
03/09/2024	21	55	54.502	-13	38	54.72	1.5378006	0.7279869	10.85	-3.8	32.3
03/10/2024	22	00	44.127	-13	15	13.65	1.5419000	0.7280256	10.82	-3.8	32.0
03/11/2024	22	05	32.748	-12	51	10.80	1.5459624	0.7280607	10.79	-3.8	31.6
03/12/2024	22	10	20.382	-12	26	46.88	1.5499878	0.7280922	10.77	-3.8	31.3
03/13/2024	22	15	07.049	-12	02	02.63	1.5539763	0.7281199	10.74	-3.8	31.0
03/14/2024	22	19	52.769	-11	36	58.76	1.5579279	0.7281440	10.71	-3.8	30.6
03/15/2024	22	24	37.564	-11	11	36.02	1.5618430	0.7281643	10.69	-3.8	30.3
03/16/2024	22	29	21.456	-10	45	55.12	1.5657215	0.7281809	10.66	-3.8	29.9
03/17/2024	22	34	04.470	-10	19	56.81	1.5695635	0.7281938	10.63	-3.8	29.5
03/18/2024	22	38	46.631	-09	53	41.81	1.5733693	0.7282029	10.61	-3.8	29.2
03/19/2024	22	43	27.966	-09	27	10.82	1.5771386	0.7282082	10.58	-3.8	28.8
03/20/2024	22	48	08.503	-09	00	24.57	1.5808716	0.7282098	10.56	-3.8	28.4
03/21/2024	22	52	48.273	-08	33	23.76	1.5845682	0.7282076	10.53	-3.8	28.0
03/22/2024	22	57	27.309	-08	06	09.10	1.5882282	0.7282017	10.51	-3.8	27.6
03/23/2024	23	02	05.642	-07	38	41.27	1.5918514	0.7281919	10.48	-3.8	27.2
03/24/2024	23	06	43.308	-07	11	00.99	1.5954378	0.7281785	10.46	-3.8	26.9
03/25/2024	23	11	20.342	-06	43	08.94	1.5989869	0.7281612	10.44	-3.8	26.5
03/26/2024	23	15	56.781	-06	15	05.82	1.6024987	0.7281403	10.41	-3.8	26.1
03/27/2024	23	20	32.662	-05	46	52.31	1.6059727	0.7281156	10.39	-3.8	25.7
03/28/2024	23	25	08.023	-05	18	29.12	1.6094086	0.7280873	10.37	-3.8	25.4
03/29/2024	23	29	42.901	-04	49	56.94	1.6128060	0.7280552	10.35	-3.8	25.0
03/30/2024	23	34	17.335	-04	21	16.46	1.6161645	0.7280195	10.33	-3.8	24.6
03/31/2024	23	38	51.362	-03	52	28.39	1.6194836	0.7279802	10.30	-3.8	24.3
04/01/2024	23	43	25.020	-03	23	33.43	1.6227629	0.7279373	10.28	-3.8	24.0
04/02/2024	23	47	58.347	-02	54	32.29	1.6260017	0.7278908	10.26	-3.8	23.6
04/03/2024	23	52	31.378	-02	25	25.68	1.6291995	0.7278408	10.24	-3.8	23.3
04/04/2024	23	57	04.151	-01	56	14.32	1.6323558	0.7277873	10.22	-3.9	23.0
04/05/2024	00	01	36.702	-01	26	58.93	1.6354700	0.7277304	10.20	-3.9	22.7
04/06/2024	00	06	09.069	-00	57	40.24	1.6385415	0.7276700	10.18	-3.9	22.3
04/07/2024	00	10	41.289	-00	28	18.95	1.6415699	0.7276063	10.17	-3.9	22.0
04/08/2024	00	15	13.402	00	01	04.20	1.6445547	0.7275393	10.15	-3.9	21.7

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		
04/09/2024	00	19	45.448	00	30	28.52	1.6474956	0.7274690	10.13	-3.9	21.4
04/10/2024	00	24	17.467	00	59	53.29	1.6503925	0.7273955	10.11	-3.9	21.1
04/11/2024	00	28	49.496	01	29	17.79	1.6532451	0.7273188	10.09	-3.9	20.7
04/12/2024	00	33	21.575	01	58	41.30	1.6560535	0.7272391	10.08	-3.9	20.4
04/13/2024	00	37	53.740	02	28	03.11	1.6588177	0.7271563	10.06	-3.9	20.0
04/14/2024	00	42	26.030	02	57	22.49	1.6615376	0.7270705	10.04	-3.9	19.6
04/15/2024	00	46	58.482	03	26	38.74	1.6642133	0.7269819	10.03	-3.9	19.3
04/16/2024	00	51	31.137	03	55	51.14	1.6668446	0.7268904	10.01	-3.9	18.9
04/17/2024	00	56	04.033	04	24	59.00	1.6694315	0.7267961	10.00	-3.9	18.5
04/18/2024	01	00	37.210	04	54	01.62	1.6719740	0.7266991	9.98	-3.9	18.1
04/19/2024	01	05	10.710	05	22	58.29	1.6744718	0.7265995	9.97	-3.9	17.7
04/20/2024	01	09	44.572	05	51	48.32	1.6769248	0.7264974	9.95	-3.9	17.3
04/21/2024	01	14	18.838	06	20	31.01	1.6793328	0.7263928	9.94	-3.9	16.9
04/22/2024	01	18	53.548	06	49	05.67	1.6816955	0.7262857	9.92	-3.9	16.5
04/23/2024	01	23	28.742	07	17	31.62	1.6840129	0.7261764	9.91	-3.9	16.1
04/24/2024	01	28	04.460	07	45	48.14	1.6862844	0.7260649	9.90	-3.9	15.6
04/25/2024	01	32	40.742	08	13	54.56	1.6885099	0.7259512	9.88	-3.9	15.2
04/26/2024	01	37	17.625	08	41	50.16	1.6906889	0.7258355	9.87	-3.9	14.8
04/27/2024	01	41	55.147	09	09	34.24	1.6928211	0.7257178	9.86	-3.9	14.4
04/28/2024	01	46	33.343	09	37	06.10	1.6949060	0.7255982	9.85	-3.9	14.0
04/29/2024	01	51	12.246	10	04	25.01	1.6969430	0.7254769	9.83	-3.9	13.7
04/30/2024	01	55	51.891	10	31	30.26	1.6989316	0.7253538	9.82	-3.9	13.3
05/01/2024	02	00	32.308	10	58	21.10	1.7008712	0.7252292	9.81	-3.9	12.9
05/02/2024	02	05	13.528	11	24	56.80	1.7027613	0.7251031	9.80	-3.9	12.5
05/03/2024	02	09	55.580	11	51	16.61	1.7046011	0.7249755	9.79	-3.9	12.2
05/04/2024	02	14	38.495	12	17	19.80	1.7063901	0.7248467	9.78	-3.9	11.8
05/05/2024	02	19	22.299	12	43	05.61	1.7081276	0.7247167	9.77	-3.9	11.5
05/06/2024	02	24	07.021	13	08	33.30	1.7098131	0.7245856	9.76	-3.9	11.2
05/07/2024	02	28	52.686	13	33	42.14	1.7114462	0.7244534	9.75	-3.9	10.8
05/08/2024	02	33	39.318	13	58	31.39	1.7130263	0.7243204	9.74	-3.9	10.5
05/09/2024	02	38	26.935	14	23	00.30	1.7145533	0.7241866	9.73	-3.9	10.1
05/10/2024	02	43	15.557	14	47	08.13	1.7160269	0.7240521	9.73	-3.9	9.8
05/11/2024	02	48	05.198	15	10	54.14	1.7174471	0.7239170	9.72	-3.9	9.4
05/12/2024	02	52	55.873	15	34	17.58	1.7188137	0.7237815	9.71	-3.9	9.1
05/13/2024	02	57	47.595	15	57	17.71	1.7201268	0.7236455	9.70	-3.9	8.7
05/14/2024	03	02	40.377	16	19	53.79	1.7213862	0.7235093	9.69	-3.9	8.3
05/15/2024	03	07	34.232	16	42	05.10	1.7225920	0.7233730	9.69	-3.9	7.9
05/16/2024	03	12	29.171	17	03	50.91	1.7237440	0.7232366	9.68	-3.9	7.5
05/17/2024	03	17	25.203	17	25	10.51	1.7248424	0.7231002	9.68	-3.9	7.1
05/18/2024	03	22	22.336	17	46	03.20	1.7258869	0.7229640	9.67	-3.9	6.7
05/19/2024	03	27	20.578	18	06	28.26	1.7268775	0.7228281	9.66	-3.9	6.3
05/20/2024	03	32	19.933	18	26	25.02	1.7278142	0.7226925	9.66	-3.9	5.9
05/21/2024	03	37	20.404	18	45	52.79	1.7286968	0.7225575	9.65	-3.9	5.4
05/22/2024	03	42	21.991	19	04	50.89	1.7295253	0.7224230	9.65	-3.9	5.0
05/23/2024	03	47	24.693	19	23	18.67	1.7302994	0.7222892	9.64	-4.0	4.6
05/24/2024	03	52	28.505	19	41	15.46	1.7310191	0.7221562	9.64	-4.0	4.1
05/25/2024	03	57	33.420	19	58	40.61	1.7316840	0.7220241	9.64	-4.0	3.7
05/26/2024	04	02	39.427	20	15	33.48	1.7322940	0.7218931	9.63	-4.0	3.3
05/27/2024	04	07	46.514	20	31	53.43	1.7328488	0.7217631	9.63	-4.0	2.8
05/28/2024	04	12	54.665	20	47	39.83	1.7333478	0.7216343	9.63	-4.0	2.4

Venus - 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		
05/29/2024	04 18 03.860	21 02 52.05	1.7337909	0.7215069	9.63	99.0	2.0
05/30/2024	04 23 14.081	21 17 29.47	1.7341773	0.7213809	9.62	99.0	1.6
05/31/2024	04 28 25.305	21 31 31.49	1.7345068	0.7212564	9.62	99.0	1.2
06/01/2024	04 33 37.507	21 44 57.53	1.7347788	0.7211335	9.62	99.0	0.8
06/02/2024	04 38 50.661	21 57 47.01	1.7349927	0.7210124	9.62	99.0	0.5
06/03/2024	04 44 04.737	22 09 59.41	1.7351481	0.7208930	9.62	99.0	0.2
06/04/2024	04 49 19.702	22 21 34.19	1.7352446	0.7207756	9.62	99.0	0.3
06/05/2024	04 54 35.518	22 32 30.87	1.7352819	0.7206601	9.62	99.0	0.7
06/06/2024	04 59 52.145	22 42 48.97	1.7352596	0.7205468	9.62	99.0	1.0
06/07/2024	05 05 09.536	22 52 28.04	1.7351776	0.7204356	9.62	99.0	1.4
06/08/2024	05 10 27.647	23 01 27.64	1.7350357	0.7203267	9.62	99.0	1.7
06/09/2024	05 15 46.426	23 09 47.37	1.7348341	0.7202201	9.62	99.0	2.1
06/10/2024	05 21 05.825	23 17 26.83	1.7345726	0.7201160	9.62	-4.0	2.5
06/11/2024	05 26 25.793	23 24 25.67	1.7342515	0.7200144	9.62	-4.0	2.8
06/12/2024	05 31 46.277	23 30 43.55	1.7338707	0.7199155	9.62	-4.0	3.2
06/13/2024	05 37 07.227	23 36 20.17	1.7334305	0.7198192	9.63	-4.0	3.6
06/14/2024	05 42 28.589	23 41 15.26	1.7329310	0.7197257	9.63	-4.0	4.0
06/15/2024	05 47 50.309	23 45 28.57	1.7323723	0.7196350	9.63	-4.0	4.4
06/16/2024	05 53 12.333	23 48 59.91	1.7317547	0.7195472	9.64	-4.0	4.8
06/17/2024	05 58 34.606	23 51 49.10	1.7310782	0.7194624	9.64	-3.9	5.2
06/18/2024	06 03 57.072	23 53 55.99	1.7303431	0.7193807	9.64	-3.9	5.6
06/19/2024	06 09 19.674	23 55 20.46	1.7295496	0.7193021	9.65	-3.9	6.0
06/20/2024	06 14 42.356	23 56 02.45	1.7286979	0.7192266	9.65	-3.9	6.5
06/21/2024	06 20 05.059	23 56 01.89	1.7277880	0.7191544	9.66	-3.9	6.9
06/22/2024	06 25 27.726	23 55 18.78	1.7268203	0.7190855	9.66	-3.9	7.3
06/23/2024	06 30 50.298	23 53 53.12	1.7257947	0.7190200	9.67	-3.9	7.8
06/24/2024	06 36 12.716	23 51 44.93	1.7247114	0.7189578	9.68	-3.9	8.2
06/25/2024	06 41 34.922	23 48 54.28	1.7235703	0.7188991	9.68	-3.9	8.7
06/26/2024	06 46 56.860	23 45 21.24	1.7223714	0.7188439	9.69	-3.9	9.1
06/27/2024	06 52 18.473	23 41 05.92	1.7211145	0.7187923	9.70	-3.9	9.5
06/28/2024	06 57 39.709	23 36 08.45	1.7197994	0.7187443	9.70	-3.9	9.9
06/29/2024	07 03 00.515	23 30 28.99	1.7184260	0.7186998	9.71	-3.9	10.3
06/30/2024	07 08 20.839	23 24 07.76	1.7169939	0.7186591	9.72	-3.9	10.8
07/01/2024	07 13 40.629	23 17 04.98	1.7155030	0.7186220	9.73	-3.9	11.1
07/02/2024	07 18 59.833	23 09 20.95	1.7139530	0.7185887	9.74	-3.9	11.5
07/03/2024	07 24 18.400	23 00 55.95	1.7123438	0.7185591	9.75	-3.9	11.9
07/04/2024	07 29 36.279	22 51 50.35	1.7106754	0.7185333	9.76	-3.9	12.3
07/05/2024	07 34 53.417	22 42 04.49	1.7089476	0.7185113	9.77	-3.9	12.6
07/06/2024	07 40 09.767	22 31 38.76	1.7071605	0.7184931	9.78	-3.9	13.0
07/07/2024	07 45 25.280	22 20 33.58	1.7053142	0.7184788	9.79	-3.9	13.4
07/08/2024	07 50 39.914	22 08 49.37	1.7034090	0.7184683	9.80	-3.9	13.7
07/09/2024	07 55 53.626	21 56 26.60	1.7014450	0.7184616	9.81	-3.9	14.1
07/10/2024	08 01 06.380	21 43 25.72	1.6994225	0.7184588	9.82	-3.9	14.4
07/11/2024	08 06 18.140	21 29 47.25	1.6973420	0.7184598	9.83	-3.9	14.8
07/12/2024	08 11 28.874	21 15 31.70	1.6952037	0.7184647	9.84	-3.9	15.1
07/13/2024	08 16 38.554	21 00 39.60	1.6930080	0.7184735	9.86	-3.9	15.5
07/14/2024	08 21 47.154	20 45 11.51	1.6907554	0.7184861	9.87	-3.9	15.9
07/15/2024	08 26 54.650	20 29 08.02	1.6884462	0.7185025	9.88	-3.9	16.3
07/16/2024	08 32 01.021	20 12 29.71	1.6860810	0.7185228	9.90	-3.9	16.6
07/17/2024	08 37 06.249	19 55 17.20	1.6836603	0.7185469	9.91	-3.9	17.0

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		
07/18/2024	08	42	10.318	19	37	31.10	1.6811844	0.7185747	9.93	-3.9	17.4
07/19/2024	08	47	13.214	19	19	12.05	1.6786540	0.7186063	9.94	-3.8	17.8
07/20/2024	08	52	14.926	19	00	20.71	1.6760695	0.7186417	9.96	-3.8	18.3
07/21/2024	08	57	15.444	18	40	57.72	1.6734315	0.7186808	9.97	-3.8	18.7
07/22/2024	09	02	14.762	18	21	03.73	1.6707404	0.7187235	9.99	-3.8	19.1
07/23/2024	09	07	12.877	18	00	39.41	1.6679966	0.7187699	10.01	-3.8	19.5
07/24/2024	09	12	09.789	17	39	45.41	1.6652004	0.7188198	10.02	-3.8	20.0
07/25/2024	09	17	05.501	17	18	22.38	1.6623520	0.7188734	10.04	-3.8	20.4
07/26/2024	09	22	00.020	16	56	30.99	1.6594516	0.7189305	10.06	-3.8	20.8
07/27/2024	09	26	53.356	16	34	11.91	1.6564992	0.7189910	10.07	-3.8	21.2
07/28/2024	09	31	45.518	16	11	25.82	1.6534950	0.7190550	10.09	-3.8	21.6
07/29/2024	09	36	36.518	15	48	13.43	1.6504388	0.7191223	10.11	-3.8	22.0
07/30/2024	09	41	26.366	15	24	35.46	1.6473308	0.7191930	10.13	-3.8	22.4
07/31/2024	09	46	15.074	15	00	32.62	1.6441710	0.7192669	10.15	-3.8	22.8
08/01/2024	09	51	02.655	14	36	05.65	1.6409594	0.7193440	10.17	-3.8	23.2
08/02/2024	09	55	49.121	14	11	15.28	1.6376961	0.7194242	10.19	-3.8	23.6
08/03/2024	10	00	34.487	13	46	02.25	1.6343814	0.7195076	10.21	-3.8	23.9
08/04/2024	10	05	18.772	13	20	27.30	1.6310153	0.7195939	10.23	-3.8	24.3
08/05/2024	10	10	01.993	12	54	31.16	1.6275983	0.7196832	10.25	-3.8	24.6
08/06/2024	10	14	44.171	12	28	14.58	1.6241306	0.7197753	10.28	-3.8	25.0
08/07/2024	10	19	25.330	12	01	38.28	1.6206125	0.7198703	10.30	-3.8	25.3
08/08/2024	10	24	05.494	11	34	43.01	1.6170446	0.7199679	10.32	-3.8	25.7
08/09/2024	10	28	44.690	11	07	29.50	1.6134272	0.7200682	10.34	-3.8	26.0
08/10/2024	10	33	22.947	10	39	58.48	1.6097608	0.7201711	10.37	-3.8	26.3
08/11/2024	10	38	00.293	10	12	10.70	1.6060460	0.7202764	10.39	-3.8	26.7
08/12/2024	10	42	36.758	09	44	06.88	1.6022833	0.7203841	10.42	-3.8	27.0
08/13/2024	10	47	12.375	09	15	47.76	1.5984732	0.7204941	10.44	-3.8	27.4
08/14/2024	10	51	47.174	08	47	14.08	1.5946163	0.7206064	10.47	-3.8	27.7
08/15/2024	10	56	21.190	08	18	26.57	1.5907134	0.7207207	10.49	-3.8	28.1
08/16/2024	11	00	54.456	07	49	25.97	1.5867650	0.7208371	10.52	-3.8	28.4
08/17/2024	11	05	27.006	07	20	13.00	1.5827718	0.7209555	10.54	-3.8	28.8
08/18/2024	11	09	58.874	06	50	48.38	1.5787346	0.7210756	10.57	-3.8	29.2
08/19/2024	11	14	30.098	06	21	12.85	1.5746540	0.7211976	10.60	-3.8	29.6
08/20/2024	11	19	00.716	05	51	27.09	1.5705306	0.7213212	10.63	-3.8	30.0
08/21/2024	11	23	30.768	05	21	31.81	1.5663651	0.7214463	10.65	-3.8	30.4
08/22/2024	11	28	00.298	04	51	27.68	1.5621579	0.7215729	10.68	-3.8	30.8
08/23/2024	11	32	29.350	04	21	15.37	1.5579095	0.7217009	10.71	-3.8	31.2
08/24/2024	11	36	57.969	03	50	55.56	1.5536200	0.7218301	10.74	-3.8	31.6
08/25/2024	11	41	26.200	03	20	28.94	1.5492897	0.7219605	10.77	-3.8	32.0
08/26/2024	11	45	54.085	02	49	56.20	1.5449188	0.7220920	10.80	-3.8	32.4
08/27/2024	11	50	21.665	02	19	18.04	1.5405073	0.7222243	10.83	-3.8	32.8
08/28/2024	11	54	48.981	01	48	35.17	1.5360553	0.7223576	10.86	-3.8	33.2
08/29/2024	11	59	16.072	01	17	48.31	1.5315630	0.7224915	10.90	-3.8	33.6
08/30/2024	12	03	42.980	00	46	58.18	1.5270304	0.7226261	10.93	-3.8	34.0
08/31/2024	12	08	09.743	00	16	05.50	1.5224578	0.7227613	10.96	-3.8	34.3
09/01/2024	12	12	36.404	-00	14	49.01	1.5178453	0.7228968	10.99	-3.8	34.7
09/02/2024	12	17	03.002	-00	45	44.64	1.5131931	0.7230327	11.03	-3.8	35.1
09/03/2024	12	21	29.579	-01	16	40.66	1.5085015	0.7231687	11.06	-3.8	35.4
09/04/2024	12	25	56.177	-01	47	36.35	1.5037708	0.7233049	11.10	-3.8	35.7
09/05/2024	12	30	22.838	-02	18	31.00	1.4990012	0.7234411	11.13	-3.8	36.1

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		
09/06/2024	12	34	49.602	-02	49	23.89	1.4941931	0.7235772	11.17	-3.8	36.4
09/07/2024	12	39	16.513	-03	20	14.29	1.4893470	0.7237130	11.21	-3.8	36.7
09/08/2024	12	43	43.610	-03	51	01.48	1.4844631	0.7238485	11.24	-3.8	37.1
09/09/2024	12	48	10.934	-04	21	44.74	1.4795421	0.7239836	11.28	-3.8	37.4
09/10/2024	12	52	38.526	-04	52	23.34	1.4745842	0.7241182	11.32	-3.8	37.7
09/11/2024	12	57	06.425	-05	22	56.54	1.4695901	0.7242521	11.36	-3.8	38.0
09/12/2024	13	01	34.671	-05	53	23.63	1.4645604	0.7243853	11.39	-3.8	38.3
09/13/2024	13	06	03.301	-06	23	43.86	1.4594954	0.7245176	11.43	-3.8	38.7
09/14/2024	13	10	32.353	-06	53	56.49	1.4543960	0.7246490	11.47	-3.8	39.0
09/15/2024	13	15	01.864	-07	24	00.80	1.4492627	0.7247794	11.52	-3.8	39.3
09/16/2024	13	19	31.874	-07	53	56.04	1.4440963	0.7249086	11.56	-3.8	39.7
09/17/2024	13	24	02.420	-08	23	41.48	1.4388974	0.7250365	11.60	-3.8	40.1
09/18/2024	13	28	33.544	-08	53	16.42	1.4336666	0.7251631	11.64	-3.8	40.4
09/19/2024	13	33	05.289	-09	22	40.13	1.4284046	0.7252883	11.68	-3.8	40.8
09/20/2024	13	37	37.697	-09	51	51.94	1.4231119	0.7254119	11.73	-3.8	41.2
09/21/2024	13	42	10.809	-10	20	51.13	1.4177888	0.7255339	11.77	-3.8	41.6
09/22/2024	13	46	44.665	-10	49	37.00	1.4124356	0.7256541	11.82	-3.8	42.0
09/23/2024	13	51	19.302	-11	18	08.83	1.4070524	0.7257725	11.86	-3.8	42.4
09/24/2024	13	55	54.754	-11	46	25.88	1.4016393	0.7258891	11.91	-3.9	42.8
09/25/2024	14	00	31.053	-12	14	27.40	1.3961965	0.7260036	11.95	-3.9	43.2
09/26/2024	14	05	08.230	-12	42	12.64	1.3907240	0.7261160	12.00	-3.9	43.6
09/27/2024	14	09	46.317	-13	09	40.84	1.3852217	0.7262262	12.05	-3.9	44.0
09/28/2024	14	14	25.341	-13	36	51.22	1.3796899	0.7263342	12.10	-3.9	44.3
09/29/2024	14	19	05.330	-14	03	43.03	1.3741284	0.7264398	12.14	-3.9	44.7
09/30/2024	14	23	46.311	-14	30	15.49	1.3685373	0.7265431	12.19	-3.9	45.1
10/01/2024	14	28	28.309	-14	56	27.82	1.3629169	0.7266438	12.24	-3.9	45.5
10/02/2024	14	33	11.347	-15	22	19.27	1.3572671	0.7267419	12.30	-3.9	45.8
10/03/2024	14	37	55.447	-15	47	49.04	1.3515881	0.7268374	12.35	-3.9	46.2
10/04/2024	14	42	40.628	-16	12	56.39	1.3458800	0.7269301	12.40	-3.9	46.5
10/05/2024	14	47	26.908	-16	37	40.52	1.3401431	0.7270201	12.45	-3.9	46.9
10/06/2024	14	52	14.302	-17	02	00.68	1.3343775	0.7271072	12.51	-3.9	47.2
10/07/2024	14	57	02.821	-17	25	56.09	1.3285834	0.7271913	12.56	-3.9	47.5
10/08/2024	15	01	52.477	-17	49	25.98	1.3227611	0.7272725	12.62	-3.9	47.8
10/09/2024	15	06	43.275	-18	12	29.59	1.3169110	0.7273506	12.67	-3.9	48.2
10/10/2024	15	11	35.221	-18	35	06.16	1.3110334	0.7274256	12.73	-3.9	48.5
10/11/2024	15	16	28.316	-18	57	14.92	1.3051286	0.7274974	12.79	-3.9	48.8
10/12/2024	15	21	22.559	-19	18	55.12	1.2991970	0.7275660	12.85	-3.9	49.1
10/13/2024	15	26	17.948	-19	40	05.99	1.2932393	0.7276313	12.90	-3.9	49.5
10/14/2024	15	31	14.479	-20	00	46.80	1.2872558	0.7276933	12.96	-3.9	49.8
10/15/2024	15	36	12.148	-20	20	56.82	1.2812473	0.7277519	13.03	-3.9	50.1
10/16/2024	15	41	10.948	-20	40	35.33	1.2752141	0.7278070	13.09	-3.9	50.5
10/17/2024	15	46	10.875	-20	59	41.64	1.2691570	0.7278588	13.15	-3.9	50.8
10/18/2024	15	51	11.921	-21	18	15.07	1.2630765	0.7279070	13.21	-4.0	51.2
10/19/2024	15	56	14.077	-21	36	14.99	1.2569730	0.7279516	13.28	-4.0	51.6
10/20/2024	16	01	17.329	-21	53	40.75	1.2508467	0.7279928	13.34	-4.0	52.0
10/21/2024	16	06	21.658	-22	10	31.70	1.2446980	0.7280303	13.41	-4.0	52.4
10/22/2024	16	11	27.042	-22	26	47.22	1.2385269	0.7280641	13.47	-4.0	52.8
10/23/2024	16	16	33.456	-22	42	26.67	1.2323335	0.7280943	13.54	-4.0	53.2
10/24/2024	16	21	40.873	-22	57	29.43	1.2261178	0.7281209	13.61	-4.0	53.6
10/25/2024	16	26	49.260	-23	11	54.89	1.2198798	0.7281437	13.68	-4.0	54.0

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		
10/26/2024	16	31	58.585	-23	25	42.45	1.2136193	0.7281628	13.75	-4.0	54.4
10/27/2024	16	37	08.811	-23	38	51.56	1.2073365	0.7281782	13.82	-4.0	54.8
10/28/2024	16	42	19.899	-23	51	21.65	1.2010312	0.7281898	13.90	-4.0	55.2
10/29/2024	16	47	31.805	-24	03	12.20	1.1947034	0.7281977	13.97	-4.0	55.6
10/30/2024	16	52	44.485	-24	14	22.70	1.1883530	0.7282018	14.04	-4.0	56.0
10/31/2024	16	57	57.889	-24	24	52.68	1.1819801	0.7282022	14.12	-4.0	56.4
11/01/2024	17	03	11.966	-24	34	41.68	1.1755846	0.7281988	14.20	-4.0	56.8
11/02/2024	17	08	26.661	-24	43	49.29	1.1691665	0.7281916	14.27	-4.0	57.2
11/03/2024	17	13	41.916	-24	52	15.11	1.1627259	0.7281807	14.35	-4.0	57.6
11/04/2024	17	18	57.668	-24	59	58.78	1.1562627	0.7281660	14.43	-4.0	58.0
11/05/2024	17	24	13.854	-25	06	59.97	1.1497772	0.7281476	14.51	-4.0	58.3
11/06/2024	17	29	30.405	-25	13	18.37	1.1432693	0.7281255	14.60	-4.1	58.7
11/07/2024	17	34	47.251	-25	18	53.71	1.1367392	0.7280997	14.68	-4.1	59.0
11/08/2024	17	40	04.322	-25	23	45.76	1.1301873	0.7280701	14.77	-4.1	59.4
11/09/2024	17	45	21.542	-25	27	54.29	1.1236137	0.7280369	14.85	-4.1	59.7
11/10/2024	17	50	38.839	-25	31	19.15	1.1170187	0.7280001	14.94	-4.1	60.1
11/11/2024	17	55	56.138	-25	34	00.18	1.1104028	0.7279597	15.03	-4.1	60.4
11/12/2024	18	01	13.365	-25	35	57.29	1.1037663	0.7279156	15.12	-4.1	60.8
11/13/2024	18	06	30.449	-25	37	10.40	1.0971099	0.7278680	15.21	-4.1	61.2
11/14/2024	18	11	47.318	-25	37	39.51	1.0904340	0.7278170	15.30	-4.1	61.5
11/15/2024	18	17	03.901	-25	37	24.63	1.0837391	0.7277624	15.40	-4.1	61.9
11/16/2024	18	22	20.129	-25	36	25.83	1.0770258	0.7277044	15.49	-4.1	62.3
11/17/2024	18	27	35.931	-25	34	43.20	1.0702945	0.7276430	15.59	-4.1	62.7
11/18/2024	18	32	51.236	-25	32	16.87	1.0635454	0.7275782	15.69	-4.1	63.1
11/19/2024	18	38	05.972	-25	29	07.00	1.0567790	0.7275102	15.79	-4.1	63.5
11/20/2024	18	43	20.069	-25	25	13.74	1.0499952	0.7274389	15.89	-4.1	63.9
11/21/2024	18	48	33.458	-25	20	37.31	1.0431943	0.7273644	16.00	-4.1	64.4
11/22/2024	18	53	46.071	-25	15	17.93	1.0363762	0.7272868	16.10	-4.1	64.8
11/23/2024	18	58	57.842	-25	09	15.85	1.0295409	0.7272061	16.21	-4.2	65.3
11/24/2024	19	04	08.704	-25	02	31.37	1.0226885	0.7271224	16.32	-4.2	65.7
11/25/2024	19	09	18.593	-24	55	04.82	1.0158188	0.7270357	16.43	-4.2	66.2
11/26/2024	19	14	27.447	-24	46	56.56	1.0089320	0.7269462	16.54	-4.2	66.7
11/27/2024	19	19	35.202	-24	38	06.97	1.0020279	0.7268538	16.65	-4.2	67.1
11/28/2024	19	24	41.798	-24	28	36.49	0.9951065	0.7267587	16.77	-4.2	67.6
11/29/2024	19	29	47.175	-24	18	25.55	0.9881677	0.7266609	16.89	-4.2	68.0
11/30/2024	19	34	51.274	-24	07	34.65	0.9812116	0.7265605	17.01	-4.2	68.5
12/01/2024	19	39	54.038	-23	56	04.31	0.9742381	0.7264576	17.13	-4.2	68.9
12/02/2024	19	44	55.410	-23	43	55.07	0.9672471	0.7263522	17.25	-4.2	69.4
12/03/2024	19	49	55.333	-23	31	07.49	0.9602388	0.7262445	17.38	-4.2	69.8
12/04/2024	19	54	53.753	-23	17	42.18	0.9532131	0.7261345	17.51	-4.2	70.3
12/05/2024	19	59	50.616	-23	03	39.76	0.9461702	0.7260222	17.64	-4.2	70.7
12/06/2024	20	04	45.871	-22	49	00.87	0.9391102	0.7259079	17.77	-4.3	71.1
12/07/2024	20	09	39.468	-22	33	46.17	0.9320333	0.7257915	17.91	-4.3	71.6
12/08/2024	20	14	31.363	-22	17	56.34	0.9249398	0.7256732	18.04	-4.3	72.0
12/09/2024	20	19	21.512	-22	01	32.08	0.9178300	0.7255531	18.18	-4.3	72.4
12/10/2024	20	24	09.876	-21	44	34.09	0.9107045	0.7254312	18.32	-4.3	72.8
12/11/2024	20	28	56.419	-21	27	03.12	0.9035637	0.7253076	18.47	-4.3	73.2
12/12/2024	20	33	41.108	-21	08	59.91	0.8964081	0.7251825	18.62	-4.3	73.7
12/13/2024	20	38	23.915	-20	50	25.23	0.8892385	0.7250559	18.77	-4.3	74.1
12/14/2024	20	43	04.812	-20	31	19.86	0.8820553	0.7249280	18.92	-4.3	74.5

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		
12/15/2024	20	47	43.773	-20	11	44.57	0.8748593	0.7247987	19.08	-4.3	75.0
12/16/2024	20	52	20.775	-19	51	40.16	0.8676509	0.7246683	19.23	-4.3	75.4
12/17/2024	20	56	55.797	-19	31	07.40	0.8604307	0.7245368	19.40	-4.4	75.9
12/18/2024	21	01	28.821	-19	10	07.08	0.8531991	0.7244044	19.56	-4.4	76.4
12/19/2024	21	05	59.830	-18	48	39.98	0.8459565	0.7242711	19.73	-4.4	76.9
12/20/2024	21	10	28.810	-18	26	46.86	0.8387031	0.7241370	19.90	-4.4	77.4
12/21/2024	21	14	55.751	-18	04	28.52	0.8314393	0.7240022	20.07	-4.4	77.9
12/22/2024	21	19	20.640	-17	41	45.74	0.8241653	0.7238670	20.25	-4.4	78.4
12/23/2024	21	23	43.467	-17	18	39.32	0.8168812	0.7237312	20.43	-4.4	78.9
12/24/2024	21	28	04.224	-16	55	10.06	0.8095873	0.7235951	20.61	-4.4	79.5
12/25/2024	21	32	22.901	-16	31	18.77	0.8022838	0.7234588	20.80	-4.4	80.0
12/26/2024	21	36	39.489	-16	07	06.27	0.7949708	0.7233224	20.99	-4.4	80.6
12/27/2024	21	40	53.978	-15	42	33.37	0.7876486	0.7231859	21.19	-4.4	81.2
12/28/2024	21	45	06.359	-15	17	40.90	0.7803173	0.7230495	21.39	-4.4	81.7
12/29/2024	21	49	16.621	-14	52	29.71	0.7729771	0.7229134	21.59	-4.4	82.3
12/30/2024	21	53	24.752	-14	27	00.64	0.7656282	0.7227775	21.80	-4.5	82.9
12/31/2024	21	57	30.740	-14	01	14.53	0.7582708	0.7226420	22.01	-4.5	83.4
01/01/2025	22	01	34.569	-13	35	12.27	0.7509052	0.7225070	22.22	-4.5	84.0



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		
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
01/03/2024	17	54	42.678	-24	00	10.13	2.4176792	1.4781337	3.87	1.4	9.0
01/04/2024	17	57	57.942	-24	01	02.03	2.4145763	1.4768656	3.88	1.4	9.2
01/05/2024	18	01	13.442	-24	01	38.71	2.4114484	1.4756006	3.88	1.4	9.4
01/06/2024	18	04	29.166	-24	02	00.12	2.4082957	1.4743388	3.89	1.4	9.6
01/07/2024	18	07	45.100	-24	02	06.22	2.4051183	1.4730804	3.89	1.4	9.8
01/08/2024	18	11	01.229	-24	01	56.96	2.4019165	1.4718254	3.90	1.4	10.0
01/09/2024	18	14	17.538	-24	01	32.32	2.3986905	1.4705740	3.90	1.4	10.2
01/10/2024	18	17	34.010	-24	00	52.28	2.3954406	1.4693263	3.91	1.4	10.4
01/11/2024	18	20	50.626	-23	59	56.80	2.3921671	1.4680824	3.91	1.4	10.6
01/12/2024	18	24	07.368	-23	58	45.87	2.3888704	1.4668425	3.92	1.4	10.8
01/13/2024	18	27	24.214	-23	57	19.45	2.3855511	1.4656067	3.93	1.4	11.0
01/14/2024	18	30	41.148	-23	55	37.54	2.3822098	1.4643751	3.93	1.4	11.2
01/15/2024	18	33	58.153	-23	53	40.10	2.3788472	1.4631478	3.94	1.4	11.4
01/16/2024	18	37	15.214	-23	51	27.11	2.3754641	1.4619250	3.94	1.4	11.6
01/17/2024	18	40	32.321	-23	48	58.59	2.3720613	1.4607068	3.95	1.4	11.8
01/18/2024	18	43	49.459	-23	46	14.53	2.3686397	1.4594933	3.95	1.4	12.0
01/19/2024	18	47	06.617	-23	43	14.96	2.3652000	1.4582847	3.96	1.4	12.2
01/20/2024	18	50	23.783	-23	39	59.91	2.3617431	1.4570810	3.97	1.4	12.3
01/21/2024	18	53	40.944	-23	36	29.41	2.3582694	1.4558824	3.97	1.4	12.5
01/22/2024	18	56	58.086	-23	32	43.49	2.3547798	1.4546891	3.98	1.4	12.7
01/23/2024	19	00	15.194	-23	28	42.19	2.3512748	1.4535011	3.98	1.4	12.8
01/24/2024	19	03	32.257	-23	24	25.53	2.3477548	1.4523187	3.99	1.4	13.0
01/25/2024	19	06	49.261	-23	19	53.56	2.3442203	1.4511418	4.00	1.4	13.2
01/26/2024	19	10	06.192	-23	15	06.31	2.3406716	1.4499706	4.00	1.4	13.3
01/27/2024	19	13	23.039	-23	10	03.81	2.3371092	1.4488054	4.01	1.4	13.5
01/28/2024	19	16	39.790	-23	04	46.10	2.3335332	1.4476461	4.01	1.3	13.7
01/29/2024	19	19	56.433	-22	59	13.23	2.3299441	1.4464929	4.02	1.3	13.8
01/30/2024	19	23	12.958	-22	53	25.24	2.3263418	1.4453460	4.03	1.3	14.0
01/31/2024	19	26	29.354	-22	47	22.20	2.3227268	1.4442055	4.03	1.3	14.2
02/01/2024	19	29	45.610	-22	41	04.15	2.3190991	1.4430715	4.04	1.3	14.4
02/02/2024	19	33	01.715	-22	34	31.18	2.3154589	1.4419441	4.04	1.3	14.6
02/03/2024	19	36	17.660	-22	27	43.34	2.3118064	1.4408235	4.05	1.3	14.8
02/04/2024	19	39	33.432	-22	20	40.73	2.3081416	1.4397097	4.06	1.3	14.9
02/05/2024	19	42	49.021	-22	13	23.44	2.3044648	1.4386030	4.06	1.3	15.1
02/06/2024	19	46	04.413	-22	05	51.57	2.3007761	1.4375034	4.07	1.3	15.3
02/07/2024	19	49	19.596	-21	58	05.21	2.2970755	1.4364110	4.08	1.3	15.6
02/08/2024	19	52	34.554	-21	50	04.48	2.2933633	1.4353261	4.08	1.3	15.8
02/09/2024	19	55	49.273	-21	41	49.49	2.2896398	1.4342486	4.09	1.3	16.0
02/10/2024	19	59	03.738	-21	33	20.34	2.2859054	1.4331788	4.10	1.3	16.2
02/11/2024	20	02	17.936	-21	24	37.15	2.2821604	1.4321168	4.10	1.3	16.3
02/12/2024	20	05	31.857	-21	15	40.02	2.2784055	1.4310626	4.11	1.3	16.5
02/13/2024	20	08	45.491	-21	06	29.06	2.2746413	1.4300164	4.12	1.3	16.7
02/14/2024	20	11	58.833	-20	57	04.39	2.2708686	1.4289784	4.12	1.3	16.9
02/15/2024	20	15	11.875	-20	47	26.14	2.2670882	1.4279487	4.13	1.3	17.1
02/16/2024	20	18	24.611	-20	37	34.46	2.2633007	1.4269273	4.14	1.3	17.2
02/17/2024	20	21	37.035	-20	27	29.49	2.2595069	1.4259144	4.14	1.3	17.4
02/18/2024	20	24	49.139	-20	17	11.36	2.2557074	1.4249101	4.15	1.3	17.5

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		
02/19/2024	20	28	00.916	-20	06	40.24	2.2519027	1.4239146	4.16	1.3	17.7
02/20/2024	20	31	12.361	-19	55	56.25	2.2480933	1.4229280	4.17	1.3	17.9
02/21/2024	20	34	23.467	-19	44	59.54	2.2442796	1.4219503	4.17	1.3	18.0
02/22/2024	20	37	34.229	-19	33	50.25	2.2404622	1.4209817	4.18	1.3	18.2
02/23/2024	20	40	44.643	-19	22	28.50	2.2366412	1.4200224	4.19	1.3	18.3
02/24/2024	20	43	54.705	-19	10	54.45	2.2328170	1.4190723	4.19	1.3	18.5
02/25/2024	20	47	04.413	-18	59	08.24	2.2289898	1.4181318	4.20	1.3	18.6
02/26/2024	20	50	13.764	-18	47	09.99	2.2251597	1.4172008	4.21	1.3	18.8
02/27/2024	20	53	22.756	-18	34	59.86	2.2213270	1.4162795	4.22	1.3	18.9
02/28/2024	20	56	31.388	-18	22	37.99	2.2174917	1.4153680	4.22	1.3	19.1
02/29/2024	20	59	39.659	-18	10	04.54	2.2136539	1.4144664	4.23	1.3	19.3
03/01/2024	21	02	47.566	-17	57	19.67	2.2098136	1.4135748	4.24	1.3	19.4
03/02/2024	21	05	55.109	-17	44	23.54	2.2059709	1.4126934	4.25	1.3	19.6
03/03/2024	21	09	02.285	-17	31	16.31	2.2021258	1.4118222	4.25	1.3	19.8
03/04/2024	21	12	09.093	-17	17	58.16	2.1982782	1.4109614	4.26	1.3	20.0
03/05/2024	21	15	15.529	-17	04	29.28	2.1944280	1.4101111	4.27	1.3	20.2
03/06/2024	21	18	21.589	-16	50	49.85	2.1905754	1.4092713	4.28	1.2	20.4
03/07/2024	21	21	27.268	-16	37	00.05	2.1867201	1.4084422	4.28	1.2	20.5
03/08/2024	21	24	32.563	-16	23	00.09	2.1828624	1.4076240	4.29	1.2	20.7
03/09/2024	21	27	37.468	-16	08	50.15	2.1790022	1.4068166	4.30	1.2	20.9
03/10/2024	21	30	41.982	-15	54	30.40	2.1751399	1.4060202	4.31	1.2	21.1
03/11/2024	21	33	46.102	-15	40	01.05	2.1712756	1.4052349	4.31	1.2	21.3
03/12/2024	21	36	49.829	-15	25	22.26	2.1674099	1.4044609	4.32	1.2	21.5
03/13/2024	21	39	53.167	-15	10	34.22	2.1635433	1.4036981	4.33	1.2	21.6
03/14/2024	21	42	56.116	-14	55	37.14	2.1596763	1.4029468	4.34	1.2	21.8
03/15/2024	21	45	58.677	-14	40	31.21	2.1558095	1.4022070	4.34	1.2	21.9
03/16/2024	21	49	00.853	-14	25	16.64	2.1519435	1.4014788	4.35	1.2	22.1
03/17/2024	21	52	02.644	-14	09	53.62	2.1480787	1.4007622	4.36	1.2	22.2
03/18/2024	21	55	04.052	-13	54	22.35	2.1442156	1.4000575	4.37	1.2	22.4
03/19/2024	21	58	05.079	-13	38	43.01	2.1403545	1.3993647	4.38	1.2	22.5
03/20/2024	22	01	05.728	-13	22	55.80	2.1364958	1.3986839	4.38	1.2	22.6
03/21/2024	22	04	06.003	-13	07	00.90	2.1326396	1.3980151	4.39	1.2	22.8
03/22/2024	22	07	05.909	-12	50	58.47	2.1287862	1.3973585	4.40	1.2	22.9
03/23/2024	22	10	05.450	-12	34	48.71	2.1249358	1.3967142	4.41	1.2	23.1
03/24/2024	22	13	04.631	-12	18	31.79	2.1210884	1.3960822	4.42	1.2	23.2
03/25/2024	22	16	03.460	-12	02	07.89	2.1172441	1.3954626	4.42	1.2	23.3
03/26/2024	22	19	01.942	-11	45	37.18	2.1134029	1.3948555	4.43	1.2	23.5
03/27/2024	22	22	00.083	-11	28	59.84	2.1095647	1.3942611	4.44	1.2	23.6
03/28/2024	22	24	57.891	-11	12	16.05	2.1057295	1.3936793	4.45	1.2	23.8
03/29/2024	22	27	55.371	-10	55	26.01	2.1018972	1.3931102	4.46	1.2	23.9
03/30/2024	22	30	52.529	-10	38	29.89	2.0980675	1.3925540	4.46	1.2	24.1
03/31/2024	22	33	49.371	-10	21	27.89	2.0942402	1.3920107	4.47	1.2	24.3
04/01/2024	22	36	45.899	-10	04	20.21	2.0904152	1.3914804	4.48	1.2	24.4
04/02/2024	22	39	42.120	-09	47	07.06	2.0865921	1.3909631	4.49	1.2	24.6
04/03/2024	22	42	38.034	-09	29	48.64	2.0827708	1.3904589	4.50	1.2	24.8
04/04/2024	22	45	33.645	-09	12	25.15	2.0789510	1.3899680	4.50	1.2	24.9
04/05/2024	22	48	28.956	-08	54	56.82	2.0751324	1.3894903	4.51	1.2	25.1
04/06/2024	22	51	23.970	-08	37	23.85	2.0713148	1.3890260	4.52	1.2	25.3
04/07/2024	22	54	18.689	-08	19	46.44	2.0674983	1.3885750	4.53	1.2	25.5
04/08/2024	22	57	13.121	-08	02	04.79	2.0636828	1.3881375	4.54	1.2	25.6

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		
04/09/2024	23	00	07.271	-07	44	19.10	2.0598684	1.3877135	4.55	1.2	25.8
04/10/2024	23	03	01.146	-07	26	29.58	2.0560553	1.3873031	4.55	1.2	25.9
04/11/2024	23	05	54.750	-07	08	36.44	2.0522440	1.3869063	4.56	1.2	26.1
04/12/2024	23	08	48.090	-06	50	39.88	2.0484347	1.3865233	4.57	1.2	26.2
04/13/2024	23	11	41.170	-06	32	40.11	2.0446277	1.3861539	4.58	1.2	26.4
04/14/2024	23	14	33.995	-06	14	37.34	2.0408233	1.3857984	4.59	1.2	26.5
04/15/2024	23	17	26.571	-05	56	31.77	2.0370219	1.3854567	4.60	1.2	26.6
04/16/2024	23	20	18.903	-05	38	23.60	2.0332236	1.3851289	4.61	1.2	26.7
04/17/2024	23	23	11.000	-05	20	13.00	2.0294285	1.3848151	4.61	1.2	26.9
04/18/2024	23	26	02.868	-05	02	00.16	2.0256369	1.3845152	4.62	1.1	27.0
04/19/2024	23	28	54.516	-04	43	45.26	2.0218486	1.3842294	4.63	1.1	27.1
04/20/2024	23	31	45.953	-04	25	28.48	2.0180637	1.3839576	4.64	1.1	27.2
04/21/2024	23	34	37.188	-04	07	09.99	2.0142822	1.3836999	4.65	1.1	27.3
04/22/2024	23	37	28.230	-03	48	49.96	2.0105040	1.3834564	4.66	1.1	27.5
04/23/2024	23	40	19.089	-03	30	28.57	2.0067288	1.3832271	4.67	1.1	27.6
04/24/2024	23	43	09.774	-03	12	05.98	2.0029566	1.3830120	4.68	1.1	27.7
04/25/2024	23	46	00.294	-02	53	42.37	1.9991870	1.3828111	4.68	1.1	27.8
04/26/2024	23	48	50.659	-02	35	17.91	1.9954198	1.3826245	4.69	1.1	28.0
04/27/2024	23	51	40.875	-02	16	52.78	1.9916546	1.3824522	4.70	1.1	28.1
04/28/2024	23	54	30.950	-01	58	27.17	1.9878911	1.3822942	4.71	1.1	28.3
04/29/2024	23	57	20.890	-01	40	01.27	1.9841287	1.3821505	4.72	1.1	28.4
04/30/2024	00	00	10.701	-01	21	35.27	1.9803670	1.3820213	4.73	1.1	28.6
05/01/2024	00	03	00.388	-01	03	09.36	1.9766056	1.3819064	4.74	1.1	28.7
05/02/2024	00	05	49.956	-00	44	43.75	1.9728439	1.3818059	4.75	1.1	28.9
05/03/2024	00	08	39.409	-00	26	18.63	1.9690815	1.3817198	4.76	1.1	29.0
05/04/2024	00	11	28.754	-00	07	54.20	1.9653181	1.3816482	4.77	1.1	29.2
05/05/2024	00	14	17.996	00	10	29.35	1.9615532	1.3815909	4.77	1.1	29.3
05/06/2024	00	17	07.142	00	28	51.82	1.9577865	1.3815482	4.78	1.1	29.5
05/07/2024	00	19	56.199	00	47	13.03	1.9540181	1.3815199	4.79	1.1	29.6
05/08/2024	00	22	45.172	01	05	32.79	1.9502477	1.3815060	4.80	1.1	29.8
05/09/2024	00	25	34.066	01	23	50.91	1.9464754	1.3815066	4.81	1.1	29.9
05/10/2024	00	28	22.886	01	42	07.18	1.9427013	1.3815217	4.82	1.1	30.1
05/11/2024	00	31	11.634	02	00	21.41	1.9389256	1.3815512	4.83	1.1	30.2
05/12/2024	00	34	00.316	02	18	33.42	1.9351484	1.3815951	4.84	1.1	30.3
05/13/2024	00	36	48.936	02	36	43.02	1.9313697	1.3816536	4.85	1.1	30.4
05/14/2024	00	39	37.499	02	54	50.03	1.9275896	1.3817264	4.86	1.1	30.5
05/15/2024	00	42	26.013	03	12	54.27	1.9238081	1.3818137	4.87	1.1	30.6
05/16/2024	00	45	14.485	03	30	55.59	1.9200253	1.3819154	4.88	1.1	30.7
05/17/2024	00	48	02.922	03	48	53.82	1.9162410	1.3820315	4.89	1.1	30.8
05/18/2024	00	50	51.333	04	06	48.81	1.9124550	1.3821619	4.90	1.1	30.9
05/19/2024	00	53	39.725	04	24	40.40	1.9086673	1.3823068	4.91	1.1	31.0
05/20/2024	00	56	28.106	04	42	28.44	1.9048777	1.3824659	4.92	1.1	31.1
05/21/2024	00	59	16.486	05	00	12.78	1.9010858	1.3826394	4.93	1.1	31.3
05/22/2024	01	02	04.872	05	17	53.27	1.8972914	1.3828272	4.94	1.1	31.4
05/23/2024	01	04	53.272	05	35	29.77	1.8934942	1.3830293	4.95	1.1	31.5
05/24/2024	01	07	41.692	05	53	02.12	1.8896937	1.3832456	4.96	1.1	31.6
05/25/2024	01	10	30.139	06	10	30.17	1.8858894	1.3834761	4.97	1.1	31.7
05/26/2024	01	13	18.618	06	27	53.76	1.8820809	1.3837208	4.98	1.1	31.8
05/27/2024	01	16	07.132	06	45	12.73	1.8782675	1.3839797	4.99	1.1	32.0
05/28/2024	01	18	55.687	07	02	26.90	1.8744486	1.3842526	5.00	1.1	32.1

Mars - 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		
05/29/2024	01 21 44.284	07 19 36.11	1.8706235	1.3845396	5.01	1.0	32.2
05/30/2024	01 24 32.927	07 36 40.17	1.8667917	1.3848407	5.02	1.0	32.4
05/31/2024	01 27 21.621	07 53 38.93	1.8629525	1.3851557	5.03	1.0	32.5
06/01/2024	01 30 10.369	08 10 32.20	1.8591054	1.3854846	5.04	1.0	32.7
06/02/2024	01 32 59.174	08 27 19.83	1.8552497	1.3858275	5.05	1.0	32.8
06/03/2024	01 35 48.041	08 44 01.65	1.8513851	1.3861842	5.06	1.0	32.9
06/04/2024	01 38 36.972	09 00 37.50	1.8475112	1.3865547	5.07	1.0	33.1
06/05/2024	01 41 25.968	09 17 07.22	1.8436277	1.3869389	5.08	1.0	33.2
06/06/2024	01 44 15.030	09 33 30.65	1.8397345	1.3873368	5.09	1.0	33.3
06/07/2024	01 47 04.158	09 49 47.62	1.8358315	1.3877483	5.10	1.0	33.4
06/08/2024	01 49 53.351	10 05 57.96	1.8319186	1.3881735	5.11	1.0	33.6
06/09/2024	01 52 42.608	10 22 01.52	1.8279958	1.3886121	5.12	1.0	33.7
06/10/2024	01 55 31.930	10 37 58.14	1.8240631	1.3890642	5.13	1.0	33.8
06/11/2024	01 58 21.320	10 53 47.67	1.8201205	1.3895297	5.15	1.0	33.9
06/12/2024	02 01 10.778	11 09 29.97	1.8161679	1.3900085	5.16	1.0	34.0
06/13/2024	02 04 00.309	11 25 04.91	1.8122051	1.3905006	5.17	1.0	34.0
06/14/2024	02 06 49.915	11 40 32.36	1.8082321	1.3910058	5.18	1.0	34.1
06/15/2024	02 09 39.601	11 55 52.18	1.8042488	1.3915242	5.19	1.0	34.2
06/16/2024	02 12 29.369	12 11 04.28	1.8002548	1.3920556	5.20	1.0	34.3
06/17/2024	02 15 19.224	12 26 08.52	1.7962500	1.3926001	5.21	1.0	34.4
06/18/2024	02 18 09.168	12 41 04.79	1.7922340	1.3931574	5.23	1.0	34.5
06/19/2024	02 20 59.205	12 55 52.99	1.7882067	1.3937275	5.24	1.0	34.6
06/20/2024	02 23 49.338	13 10 33.01	1.7841676	1.3943104	5.25	1.0	34.7
06/21/2024	02 26 39.568	13 25 04.74	1.7801162	1.3949060	5.26	1.0	34.8
06/22/2024	02 29 29.895	13 39 28.06	1.7760522	1.3955141	5.27	1.0	34.9
06/23/2024	02 32 20.321	13 53 42.85	1.7719749	1.3961348	5.29	1.0	35.0
06/24/2024	02 35 10.844	14 07 49.01	1.7678837	1.3967679	5.30	1.0	35.1
06/25/2024	02 38 01.462	14 21 46.38	1.7637779	1.3974133	5.31	1.0	35.2
06/26/2024	02 40 52.175	14 35 34.86	1.7596568	1.3980709	5.32	1.0	35.3
06/27/2024	02 43 42.981	14 49 14.31	1.7555197	1.3987408	5.33	1.0	35.4
06/28/2024	02 46 33.880	15 02 44.59	1.7513659	1.3994227	5.35	1.0	35.6
06/29/2024	02 49 24.869	15 16 05.61	1.7471946	1.4001166	5.36	1.0	35.7
06/30/2024	02 52 15.948	15 29 17.23	1.7430054	1.4008223	5.37	1.0	35.8
07/01/2024	02 55 07.112	15 42 19.35	1.7387976	1.4015399	5.39	1.0	35.9
07/02/2024	02 57 58.358	15 55 11.86	1.7345709	1.4022692	5.40	1.0	36.1
07/03/2024	03 00 49.679	16 07 54.66	1.7303248	1.4030100	5.41	1.0	36.2
07/04/2024	03 03 41.069	16 20 27.63	1.7260592	1.4037624	5.43	1.0	36.3
07/05/2024	03 06 32.519	16 32 50.66	1.7217738	1.4045262	5.44	1.0	36.4
07/06/2024	03 09 24.022	16 45 03.65	1.7174685	1.4053013	5.45	1.0	36.5
07/07/2024	03 12 15.570	16 57 06.49	1.7131433	1.4060876	5.47	1.0	36.6
07/08/2024	03 15 07.158	17 08 59.08	1.7087980	1.4068850	5.48	1.0	36.7
07/09/2024	03 17 58.780	17 20 41.33	1.7044325	1.4076934	5.49	1.0	36.8
07/10/2024	03 20 50.431	17 32 13.16	1.7000470	1.4085127	5.51	1.0	36.8
07/11/2024	03 23 42.107	17 43 34.49	1.6956411	1.4093427	5.52	1.0	36.9
07/12/2024	03 26 33.804	17 54 45.25	1.6912149	1.4101835	5.54	1.0	37.0
07/13/2024	03 29 25.519	18 05 45.37	1.6867682	1.4110349	5.55	0.9	37.1
07/14/2024	03 32 17.247	18 16 34.81	1.6823010	1.4118967	5.57	0.9	37.1
07/15/2024	03 35 08.987	18 27 13.50	1.6778129	1.4127688	5.58	0.9	37.2
07/16/2024	03 38 00.732	18 37 41.39	1.6733038	1.4136513	5.60	0.9	37.3
07/17/2024	03 40 52.480	18 47 58.45	1.6687735	1.4145438	5.61	0.9	37.4

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		
07/18/2024	03	43	44.225	18	58	04.63	1.6642216	1.4154464	5.63	0.9	37.4
07/19/2024	03	46	35.962	19	07	59.90	1.6596480	1.4163589	5.64	0.9	37.5
07/20/2024	03	49	27.684	19	17	44.20	1.6550521	1.4172812	5.66	0.9	37.6
07/21/2024	03	52	19.385	19	27	17.49	1.6504335	1.4182131	5.67	0.9	37.7
07/22/2024	03	55	11.058	19	36	39.72	1.6457916	1.4191547	5.69	0.9	37.8
07/23/2024	03	58	02.694	19	45	50.84	1.6411258	1.4201057	5.71	0.9	37.9
07/24/2024	04	00	54.286	19	54	50.79	1.6364354	1.4210660	5.72	0.9	38.0
07/25/2024	04	03	45.827	20	03	39.51	1.6317197	1.4220355	5.74	0.9	38.1
07/26/2024	04	06	37.310	20	12	16.96	1.6269781	1.4230142	5.76	0.9	38.2
07/27/2024	04	09	28.727	20	20	43.11	1.6222098	1.4240018	5.77	0.9	38.3
07/28/2024	04	12	20.069	20	28	57.92	1.6174143	1.4249982	5.79	0.9	38.4
07/29/2024	04	15	11.323	20	37	01.37	1.6125911	1.4260034	5.81	0.9	38.5
07/30/2024	04	18	02.477	20	44	53.44	1.6077398	1.4270173	5.83	0.9	38.6
07/31/2024	04	20	53.517	20	52	34.11	1.6028600	1.4280396	5.84	0.9	38.7
08/01/2024	04	23	44.428	21	00	03.35	1.5979515	1.4290703	5.86	0.9	38.8
08/02/2024	04	26	35.194	21	07	21.16	1.5930142	1.4301093	5.88	0.9	38.9
08/03/2024	04	29	25.801	21	14	27.51	1.5880479	1.4311563	5.90	0.9	39.0
08/04/2024	04	32	16.234	21	21	22.40	1.5830527	1.4322114	5.92	0.9	39.0
08/05/2024	04	35	06.479	21	28	05.81	1.5780285	1.4332744	5.93	0.9	39.1
08/06/2024	04	37	56.525	21	34	37.74	1.5729752	1.4343451	5.95	0.9	39.2
08/07/2024	04	40	46.359	21	40	58.21	1.5678930	1.4354235	5.97	0.9	39.2
08/08/2024	04	43	35.970	21	47	07.22	1.5627818	1.4365094	5.99	0.9	39.3
08/09/2024	04	46	25.348	21	53	04.81	1.5576417	1.4376027	6.01	0.9	39.4
08/10/2024	04	49	14.483	21	58	51.00	1.5524727	1.4387032	6.03	0.8	39.4
08/11/2024	04	52	03.363	22	04	25.83	1.5472748	1.4398108	6.05	0.8	39.5
08/12/2024	04	54	51.979	22	09	49.34	1.5420480	1.4409255	6.07	0.8	39.5
08/13/2024	04	57	40.320	22	15	01.57	1.5367922	1.4420470	6.09	0.8	39.6
08/14/2024	05	00	28.375	22	20	02.59	1.5315074	1.4431753	6.12	0.8	39.6
08/15/2024	05	03	16.134	22	24	52.43	1.5261934	1.4443103	6.14	0.8	39.7
08/16/2024	05	06	03.586	22	29	31.17	1.5208503	1.4454517	6.16	0.8	39.7
08/17/2024	05	08	50.717	22	33	58.85	1.5154777	1.4465995	6.18	0.8	39.8
08/18/2024	05	11	37.517	22	38	15.53	1.5100754	1.4477535	6.20	0.8	39.8
08/19/2024	05	14	23.974	22	42	21.24	1.5046431	1.4489137	6.22	0.8	39.9
08/20/2024	05	17	10.074	22	46	16.05	1.4991803	1.4500799	6.25	0.8	40.0
08/21/2024	05	19	55.808	22	49	59.97	1.4936865	1.4512519	6.27	0.8	40.0
08/22/2024	05	22	41.165	22	53	33.08	1.4881612	1.4524297	6.29	0.8	40.1
08/23/2024	05	25	26.133	22	56	55.42	1.4826037	1.4536130	6.32	0.8	40.2
08/24/2024	05	28	10.700	23	00	07.06	1.4770137	1.4548019	6.34	0.8	40.3
08/25/2024	05	30	54.850	23	03	08.09	1.4713905	1.4559961	6.36	0.8	40.3
08/26/2024	05	33	38.568	23	05	58.60	1.4657338	1.4571956	6.39	0.8	40.4
08/27/2024	05	36	21.833	23	08	38.68	1.4600435	1.4584001	6.41	0.8	40.5
08/28/2024	05	39	04.627	23	11	08.41	1.4543193	1.4596096	6.44	0.7	40.6
08/29/2024	05	41	46.930	23	13	27.89	1.4485611	1.4608240	6.47	0.7	40.6
08/30/2024	05	44	28.722	23	15	37.21	1.4427689	1.4620431	6.49	0.7	40.7
08/31/2024	05	47	09.983	23	17	36.47	1.4369428	1.4632668	6.52	0.7	40.8
09/01/2024	05	49	50.696	23	19	25.77	1.4310830	1.4644949	6.54	0.7	40.8
09/02/2024	05	52	30.844	23	21	05.21	1.4251896	1.4657274	6.57	0.7	40.9
09/03/2024	05	55	10.410	23	22	34.90	1.4192627	1.4669641	6.60	0.7	40.9
09/04/2024	05	57	49.378	23	23	54.97	1.4133027	1.4682049	6.63	0.7	40.9
09/05/2024	06	00	27.735	23	25	05.53	1.4073098	1.4694496	6.65	0.7	41.0

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		
09/06/2024	06	03	05.465	23	26	06.71	1.4012842	1.4706982	6.68	0.7	41.0
09/07/2024	06	05	42.554	23	26	58.65	1.3952262	1.4719505	6.71	0.7	41.0
09/08/2024	06	08	18.990	23	27	41.50	1.3891362	1.4732064	6.74	0.7	41.0
09/09/2024	06	10	54.757	23	28	15.39	1.3830142	1.4744657	6.77	0.7	41.0
09/10/2024	06	13	29.842	23	28	40.49	1.3768607	1.4757284	6.80	0.7	41.0
09/11/2024	06	16	04.233	23	28	56.95	1.3706759	1.4769942	6.83	0.7	41.1
09/12/2024	06	18	37.914	23	29	04.91	1.3644599	1.4782632	6.86	0.7	41.1
09/13/2024	06	21	10.871	23	29	04.54	1.3582130	1.4795351	6.90	0.6	41.1
09/14/2024	06	23	43.091	23	28	56.00	1.3519354	1.4808099	6.93	0.6	41.1
09/15/2024	06	26	14.560	23	28	39.43	1.3456271	1.4820873	6.96	0.6	41.1
09/16/2024	06	28	45.264	23	28	14.98	1.3392881	1.4833674	6.99	0.6	41.1
09/17/2024	06	31	15.191	23	27	42.78	1.3329184	1.4846499	7.03	0.6	41.2
09/18/2024	06	33	44.327	23	27	02.98	1.3265177	1.4859348	7.06	0.6	41.2
09/19/2024	06	36	12.663	23	26	15.73	1.3200859	1.4872219	7.09	0.6	41.2
09/20/2024	06	38	40.184	23	25	21.19	1.3136227	1.4885111	7.13	0.6	41.3
09/21/2024	06	41	06.877	23	24	19.53	1.3071278	1.4898023	7.16	0.6	41.3
09/22/2024	06	43	32.723	23	23	10.95	1.3006012	1.4910953	7.20	0.6	41.3
09/23/2024	06	45	57.702	23	21	55.64	1.2940426	1.4923901	7.24	0.6	41.3
09/24/2024	06	48	21.791	23	20	33.79	1.2874523	1.4936865	7.27	0.5	41.4
09/25/2024	06	50	44.969	23	19	05.61	1.2808303	1.4949844	7.31	0.5	41.4
09/26/2024	06	53	07.211	23	17	31.30	1.2741769	1.4962837	7.35	0.5	41.4
09/27/2024	06	55	28.495	23	15	51.05	1.2674924	1.4975843	7.39	0.5	41.4
09/28/2024	06	57	48.799	23	14	05.07	1.2607773	1.4988860	7.43	0.5	41.4
09/29/2024	07	00	08.104	23	12	13.56	1.2540321	1.5001887	7.47	0.5	41.4
09/30/2024	07	02	26.387	23	10	16.73	1.2472573	1.5014924	7.51	0.5	41.4
10/01/2024	07	04	43.631	23	08	14.79	1.2404535	1.5027969	7.55	0.5	41.4
10/02/2024	07	06	59.816	23	06	07.96	1.2336213	1.5041020	7.59	0.5	41.4
10/03/2024	07	09	14.922	23	03	56.47	1.2267615	1.5054077	7.63	0.5	41.4
10/04/2024	07	11	28.933	23	01	40.54	1.2198748	1.5067139	7.68	0.5	41.3
10/05/2024	07	13	41.830	22	59	20.41	1.2129618	1.5080204	7.72	0.4	41.3
10/06/2024	07	15	53.596	22	56	56.31	1.2060233	1.5093271	7.77	0.4	41.2
10/07/2024	07	18	04.211	22	54	28.49	1.1990602	1.5106339	7.81	0.4	41.2
10/08/2024	07	20	13.658	22	51	57.19	1.1920732	1.5119407	7.86	0.4	41.1
10/09/2024	07	22	21.918	22	49	22.65	1.1850630	1.5132475	7.90	0.4	41.1
10/10/2024	07	24	28.974	22	46	45.12	1.1780305	1.5145540	7.95	0.4	41.0
10/11/2024	07	26	34.805	22	44	04.85	1.1709763	1.5158601	8.00	0.4	40.9
10/12/2024	07	28	39.394	22	41	22.07	1.1639013	1.5171659	8.05	0.4	40.9
10/13/2024	07	30	42.722	22	38	37.02	1.1568060	1.5184710	8.10	0.3	40.8
10/14/2024	07	32	44.770	22	35	49.93	1.1496911	1.5197755	8.15	0.3	40.8
10/15/2024	07	34	45.523	22	33	01.02	1.1425572	1.5210793	8.20	0.3	40.7
10/16/2024	07	36	44.963	22	30	10.52	1.1354046	1.5223821	8.25	0.3	40.6
10/17/2024	07	38	43.072	22	27	18.67	1.1282338	1.5236840	8.30	0.3	40.6
10/18/2024	07	40	39.833	22	24	25.71	1.1210452	1.5249848	8.35	0.3	40.5
10/19/2024	07	42	35.223	22	21	31.92	1.1138391	1.5262844	8.41	0.3	40.5
10/20/2024	07	44	29.217	22	18	37.57	1.1066160	1.5275827	8.46	0.3	40.4
10/21/2024	07	46	21.784	22	15	42.97	1.0993764	1.5288796	8.52	0.2	40.4
10/22/2024	07	48	12.895	22	12	48.40	1.0921211	1.5301749	8.58	0.2	40.3
10/23/2024	07	50	02.515	22	09	54.17	1.0848508	1.5314687	8.63	0.2	40.2
10/24/2024	07	51	50.613	22	07	00.57	1.0775665	1.5327607	8.69	0.2	40.1
10/25/2024	07	53	37.156	22	04	07.90	1.0702693	1.5340509	8.75	0.2	40.0

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		
10/26/2024	07	55	22.112	22	01	16.45	1.0629604	1.5353392	8.81	0.2	39.9
10/27/2024	07	57	05.450	21	58	26.52	1.0556409	1.5366255	8.87	0.2	39.8
10/28/2024	07	58	47.137	21	55	38.42	1.0483123	1.5379097	8.93	0.1	39.7
10/29/2024	08	00	27.144	21	52	52.46	1.0409759	1.5391916	9.00	0.1	39.6
10/30/2024	08	02	05.438	21	50	08.94	1.0336332	1.5404713	9.06	0.1	39.5
10/31/2024	08	03	41.988	21	47	28.18	1.0262857	1.5417485	9.13	0.1	39.3
11/01/2024	08	05	16.762	21	44	50.50	1.0189352	1.5430232	9.19	0.1	39.2
11/02/2024	08	06	49.730	21	42	16.21	1.0115832	1.5442953	9.26	0.1	39.0
11/03/2024	08	08	20.858	21	39	45.64	1.0042314	1.5455647	9.33	0.1	38.8
11/04/2024	08	09	50.114	21	37	19.10	0.9968816	1.5468312	9.39	0.0	38.6
11/05/2024	08	11	17.466	21	34	56.93	0.9895356	1.5480949	9.46	0.0	38.5
11/06/2024	08	12	42.879	21	32	39.44	0.9821952	1.5493556	9.54	-0.0	38.3
11/07/2024	08	14	06.319	21	30	26.94	0.9748623	1.5506133	9.61	-0.0	38.1
11/08/2024	08	15	27.753	21	28	19.75	0.9675386	1.5518677	9.68	-0.0	37.9
11/09/2024	08	16	47.147	21	26	18.17	0.9602260	1.5531189	9.75	-0.1	37.6
11/10/2024	08	18	04.467	21	24	22.49	0.9529263	1.5543667	9.83	-0.1	37.4
11/11/2024	08	19	19.679	21	22	33.00	0.9456412	1.5556111	9.90	-0.1	37.2
11/12/2024	08	20	32.750	21	20	49.98	0.9383726	1.5568519	9.98	-0.1	37.0
11/13/2024	08	21	43.646	21	19	13.72	0.9311220	1.5580891	10.06	-0.1	36.8
11/14/2024	08	22	52.333	21	17	44.51	0.9238912	1.5593227	10.14	-0.2	36.5
11/15/2024	08	23	58.774	21	16	22.65	0.9166817	1.5605524	10.22	-0.2	36.3
11/16/2024	08	25	02.927	21	15	08.45	0.9094954	1.5617782	10.30	-0.2	36.1
11/17/2024	08	26	04.747	21	14	02.25	0.9023340	1.5630000	10.38	-0.2	35.8
11/18/2024	08	27	04.185	21	13	04.40	0.8951994	1.5642178	10.46	-0.2	35.6
11/19/2024	08	28	01.188	21	12	15.22	0.8880937	1.5654314	10.55	-0.2	35.3
11/20/2024	08	28	55.703	21	11	35.05	0.8810192	1.5666408	10.63	-0.3	35.1
11/21/2024	08	29	47.678	21	11	04.21	0.8739782	1.5678459	10.72	-0.3	34.8
11/22/2024	08	30	37.058	21	10	43.01	0.8669735	1.5690466	10.80	-0.3	34.5
11/23/2024	08	31	23.792	21	10	31.77	0.8600076	1.5702428	10.89	-0.3	34.2
11/24/2024	08	32	07.827	21	10	30.78	0.8530836	1.5714344	10.98	-0.3	33.9
11/25/2024	08	32	49.113	21	10	40.33	0.8462044	1.5726215	11.07	-0.4	33.6
11/26/2024	08	33	27.600	21	11	00.69	0.8393731	1.5738038	11.16	-0.4	33.2
11/27/2024	08	34	03.236	21	11	32.15	0.8325929	1.5749812	11.25	-0.4	32.8
11/28/2024	08	34	35.972	21	12	14.95	0.8258672	1.5761539	11.34	-0.4	32.5
11/29/2024	08	35	05.760	21	13	09.35	0.8191993	1.5773215	11.43	-0.5	32.1
11/30/2024	08	35	32.551	21	14	15.56	0.8125929	1.5784841	11.53	-0.5	31.7
12/01/2024	08	35	56.298	21	15	33.81	0.8060514	1.5796416	11.62	-0.5	31.3
12/02/2024	08	36	16.956	21	17	04.27	0.7995787	1.5807940	11.71	-0.5	30.8
12/03/2024	08	36	34.479	21	18	47.12	0.7931784	1.5819410	11.81	-0.5	30.4
12/04/2024	08	36	48.826	21	20	42.51	0.7868543	1.5830828	11.90	-0.6	29.9
12/05/2024	08	36	59.954	21	22	50.53	0.7806103	1.5842191	12.00	-0.6	29.5
12/06/2024	08	37	07.825	21	25	11.28	0.7744502	1.5853499	12.09	-0.6	29.0
12/07/2024	08	37	12.405	21	27	44.78	0.7683778	1.5864752	12.19	-0.6	28.5
12/08/2024	08	37	13.659	21	30	31.06	0.7623970	1.5875948	12.28	-0.7	28.0
12/09/2024	08	37	11.560	21	33	30.09	0.7565115	1.5887088	12.38	-0.7	27.5
12/10/2024	08	37	06.080	21	36	41.82	0.7507252	1.5898170	12.48	-0.7	27.0
12/11/2024	08	36	57.195	21	40	06.17	0.7450416	1.5909193	12.57	-0.7	26.4
12/12/2024	08	36	44.882	21	43	43.05	0.7394647	1.5920157	12.66	-0.8	25.9
12/13/2024	08	36	29.119	21	47	32.35	0.7339981	1.5931062	12.76	-0.8	25.4
12/14/2024	08	36	09.885	21	51	33.93	0.7286456	1.5941906	12.85	-0.8	24.8

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.
12/15/2024	08 35 47.158	21 55 47.64	0.7234111	1.5952689	12.95	-0.8	24.3
12/16/2024	08 35 20.917	22 00 13.29	0.7182985	1.5963410	13.04	-0.9	23.7
12/17/2024	08 34 51.145	22 04 50.67	0.7133121	1.5974069	13.13	-0.9	23.1
12/18/2024	08 34 17.828	22 09 39.51	0.7084561	1.5984665	13.22	-0.9	22.5
12/19/2024	08 33 40.959	22 14 39.48	0.7037349	1.5995196	13.31	-0.9	21.9
12/20/2024	08 33 00.539	22 19 50.22	0.6991530	1.6005664	13.40	-0.9	21.3
12/21/2024	08 32 16.576	22 25 11.33	0.6947149	1.6016066	13.48	-1.0	20.7
12/22/2024	08 31 29.086	22 30 42.34	0.6904254	1.6026403	13.56	-1.0	20.0
12/23/2024	08 30 38.094	22 36 22.74	0.6862892	1.6036674	13.65	-1.0	19.3
12/24/2024	08 29 43.633	22 42 11.97	0.6823109	1.6046878	13.73	-1.0	18.6
12/25/2024	08 28 45.747	22 48 09.45	0.6784952	1.6057014	13.80	-1.1	17.9
12/26/2024	08 27 44.486	22 54 14.50	0.6748469	1.6067082	13.88	-1.1	17.2
12/27/2024	08 26 39.914	23 00 26.45	0.6713704	1.6077081	13.95	-1.1	16.5
12/28/2024	08 25 32.101	23 06 44.57	0.6680704	1.6087012	14.02	-1.1	15.7
12/29/2024	08 24 21.130	23 13 08.06	0.6649514	1.6096872	14.08	-1.1	15.0
12/30/2024	08 23 07.093	23 19 36.12	0.6620176	1.6106662	14.15	-1.2	14.2
12/31/2024	08 21 50.094	23 26 07.90	0.6592733	1.6116381	14.21	-1.2	13.4
01/01/2025	08 20 30.247	23 32 42.50	0.6567224	1.6126029	14.26	-1.2	12.6



Jupiter - 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.
12/31/2023	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
01/03/2024	02 14 46.712	12 16 40.65	4.5108635	4.9852742	43.70	-2.6	10.4
01/04/2024	02 14 49.011	12 17 11.99	4.5257195	4.9854660	43.56	-2.6	10.5
01/05/2024	02 14 52.113	12 17 47.42	4.5406826	4.9856583	43.42	-2.6	10.6
01/06/2024	02 14 56.016	12 18 26.94	4.5557481	4.9858511	43.27	-2.6	10.7
01/07/2024	02 15 00.722	12 19 10.55	4.5709112	4.9860444	43.13	-2.6	10.8
01/08/2024	02 15 06.228	12 19 58.24	4.5861671	4.9862381	42.99	-2.6	10.8
01/09/2024	02 15 12.532	12 20 49.99	4.6015110	4.9864324	42.84	-2.5	10.9
01/10/2024	02 15 19.632	12 21 45.78	4.6169380	4.9866271	42.70	-2.5	11.0
01/11/2024	02 15 27.523	12 22 45.60	4.6324430	4.9868223	42.56	-2.5	11.0
01/12/2024	02 15 36.200	12 23 49.39	4.6480211	4.9870180	42.41	-2.5	11.1
01/13/2024	02 15 45.657	12 24 57.12	4.6636670	4.9872142	42.27	-2.5	11.1
01/14/2024	02 15 55.888	12 26 08.74	4.6793757	4.9874109	42.13	-2.5	11.2
01/15/2024	02 16 06.891	12 27 24.20	4.6951421	4.9876081	41.99	-2.5	11.2
01/16/2024	02 16 18.660	12 28 43.46	4.7109611	4.9878057	41.85	-2.5	11.2
01/17/2024	02 16 31.193	12 30 06.48	4.7268280	4.9880038	41.71	-2.5	11.3
01/18/2024	02 16 44.486	12 31 33.23	4.7427380	4.9882025	41.57	-2.5	11.3
01/19/2024	02 16 58.534	12 33 03.68	4.7586866	4.9884015	41.43	-2.5	11.3
01/20/2024	02 17 13.331	12 34 37.79	4.7746692	4.9886011	41.29	-2.5	11.3
01/21/2024	02 17 28.870	12 36 15.52	4.7906816	4.9888012	41.15	-2.5	11.3
01/22/2024	02 17 45.143	12 37 56.81	4.8067195	4.9890017	41.01	-2.4	11.4
01/23/2024	02 18 02.143	12 39 41.62	4.8227789	4.9892027	40.88	-2.4	11.4
01/24/2024	02 18 19.862	12 41 29.89	4.8388557	4.9894042	40.74	-2.4	11.4
01/25/2024	02 18 38.291	12 43 21.57	4.8549459	4.9896062	40.61	-2.4	11.4
01/26/2024	02 18 57.425	12 45 16.61	4.8710457	4.9898087	40.47	-2.4	11.4
01/27/2024	02 19 17.257	12 47 14.94	4.8871512	4.9900116	40.34	-2.4	11.4
01/28/2024	02 19 37.780	12 49 16.52	4.9032586	4.9902150	40.21	-2.4	11.4
01/29/2024	02 19 58.989	12 51 21.31	4.9193639	4.9904189	40.08	-2.4	11.4
01/30/2024	02 20 20.879	12 53 29.25	4.9354635	4.9906232	39.94	-2.4	11.4
01/31/2024	02 20 43.445	12 55 40.30	4.9515535	4.9908281	39.81	-2.4	11.4
02/01/2024	02 21 06.681	12 57 54.43	4.9676302	4.9910334	39.69	-2.4	11.4
02/02/2024	02 21 30.584	13 00 11.60	4.9836897	4.9912392	39.56	-2.4	11.4
02/03/2024	02 21 55.147	13 02 31.76	4.9997283	4.9914455	39.43	-2.4	11.4
02/04/2024	02 22 20.366	13 04 54.88	5.0157421	4.9916522	39.31	-2.4	11.3
02/05/2024	02 22 46.234	13 07 20.92	5.0317273	4.9918594	39.18	-2.3	11.3
02/06/2024	02 23 12.745	13 09 49.83	5.0476800	4.9920671	39.06	-2.3	11.3
02/07/2024	02 23 39.892	13 12 21.57	5.0635965	4.9922753	38.93	-2.3	11.3
02/08/2024	02 24 07.665	13 14 56.08	5.0794726	4.9924839	38.81	-2.3	11.3
02/09/2024	02 24 36.057	13 17 33.29	5.0953044	4.9926930	38.69	-2.3	11.2
02/10/2024	02 25 05.059	13 20 13.15	5.1110879	4.9929026	38.57	-2.3	11.2
02/11/2024	02 25 34.663	13 22 55.57	5.1268192	4.9931126	38.45	-2.3	11.2
02/12/2024	02 26 04.864	13 25 40.49	5.1424942	4.9933231	38.34	-2.3	11.1
02/13/2024	02 26 35.655	13 28 27.87	5.1581092	4.9935341	38.22	-2.3	11.1
02/14/2024	02 27 07.032	13 31 17.65	5.1736605	4.9937455	38.11	-2.3	11.0
02/15/2024	02 27 38.987	13 34 09.79	5.1891447	4.9939575	37.99	-2.3	11.0
02/16/2024	02 28 11.514	13 37 04.23	5.2045584	4.9941698	37.88	-2.3	10.9
02/17/2024	02 28 44.604	13 40 00.94	5.2198984	4.9943827	37.77	-2.3	10.8
02/18/2024	02 29 18.248	13 42 59.84	5.2351618	4.9945960	37.66	-2.3	10.8

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		
02/19/2024	02	29	52.436	13	46	00.88	5.2503456	4.9948098	37.55	-2.3	10.7
02/20/2024	02	30	27.161	13	49	03.99	5.2654469	4.9950240	37.44	-2.3	10.7
02/21/2024	02	31	02.412	13	52	09.12	5.2804630	4.9952387	37.33	-2.2	10.6
02/22/2024	02	31	38.183	13	55	16.20	5.2953913	4.9954539	37.23	-2.2	10.5
02/23/2024	02	32	14.465	13	58	25.17	5.3102290	4.9956696	37.13	-2.2	10.5
02/24/2024	02	32	51.253	14	01	35.98	5.3249736	4.9958857	37.02	-2.2	10.4
02/25/2024	02	33	28.538	14	04	48.56	5.3396225	4.9961022	36.92	-2.2	10.3
02/26/2024	02	34	06.316	14	08	02.88	5.3541731	4.9963192	36.82	-2.2	10.3
02/27/2024	02	34	44.582	14	11	18.89	5.3686229	4.9965367	36.72	-2.2	10.2
02/28/2024	02	35	23.329	14	14	36.53	5.3829694	4.9967547	36.62	-2.2	10.1
02/29/2024	02	36	02.553	14	17	55.77	5.3972101	4.9969731	36.53	-2.2	10.0
03/01/2024	02	36	42.249	14	21	16.57	5.4113424	4.9971919	36.43	-2.2	10.0
03/02/2024	02	37	22.411	14	24	38.89	5.4253638	4.9974113	36.34	-2.2	9.9
03/03/2024	02	38	03.034	14	28	02.69	5.4392718	4.9976310	36.24	-2.2	9.8
03/04/2024	02	38	44.110	14	31	27.93	5.4530637	4.9978513	36.15	-2.2	9.7
03/05/2024	02	39	25.634	14	34	54.56	5.4667372	4.9980720	36.06	-2.2	9.7
03/06/2024	02	40	07.598	14	38	22.53	5.4802894	4.9982931	35.97	-2.2	9.6
03/07/2024	02	40	49.993	14	41	51.78	5.4937177	4.9985147	35.89	-2.2	9.5
03/08/2024	02	41	32.813	14	45	22.26	5.5070194	4.9987368	35.80	-2.2	9.4
03/09/2024	02	42	16.048	14	48	53.90	5.5201919	4.9989593	35.71	-2.2	9.3
03/10/2024	02	42	59.694	14	52	26.64	5.5332323	4.9991823	35.63	-2.1	9.2
03/11/2024	02	43	43.745	14	56	00.42	5.5461381	4.9994057	35.55	-2.1	9.1
03/12/2024	02	44	28.196	14	59	35.20	5.5589067	4.9996295	35.46	-2.1	9.0
03/13/2024	02	45	13.044	15	03	10.93	5.5715358	4.9998539	35.38	-2.1	8.9
03/14/2024	02	45	58.281	15	06	47.58	5.5840232	5.0000786	35.31	-2.1	8.8
03/15/2024	02	46	43.901	15	10	25.10	5.5963668	5.0003039	35.23	-2.1	8.7
03/16/2024	02	47	29.896	15	14	03.46	5.6085647	5.0005295	35.15	-2.1	8.6
03/17/2024	02	48	16.256	15	17	42.59	5.6206152	5.0007557	35.08	-2.1	8.4
03/18/2024	02	49	02.973	15	21	22.45	5.6325167	5.0009822	35.00	-2.1	8.3
03/19/2024	02	49	50.040	15	25	02.97	5.6442675	5.0012092	34.93	-2.1	8.2
03/20/2024	02	50	37.449	15	28	44.10	5.6558662	5.0014367	34.86	-2.1	8.1
03/21/2024	02	51	25.193	15	32	25.79	5.6673112	5.0016646	34.79	-2.1	8.0
03/22/2024	02	52	13.267	15	36	08.00	5.6786011	5.0018930	34.72	-2.1	7.9
03/23/2024	02	53	01.664	15	39	50.67	5.6897345	5.0021218	34.65	-2.1	7.8
03/24/2024	02	53	50.381	15	43	33.76	5.7007100	5.0023510	34.58	-2.1	7.7
03/25/2024	02	54	39.412	15	47	17.23	5.7115262	5.0025807	34.52	-2.1	7.5
03/26/2024	02	55	28.753	15	51	01.05	5.7221818	5.0028109	34.45	-2.1	7.4
03/27/2024	02	56	18.400	15	54	45.19	5.7326753	5.0030414	34.39	-2.1	7.3
03/28/2024	02	57	08.349	15	58	29.60	5.7430055	5.0032725	34.33	-2.1	7.2
03/29/2024	02	57	58.595	16	02	14.27	5.7531710	5.0035039	34.27	-2.1	7.1
03/30/2024	02	58	49.134	16	05	59.16	5.7631703	5.0037358	34.21	-2.1	7.0
03/31/2024	02	59	39.960	16	09	44.24	5.7730021	5.0039682	34.15	-2.1	6.9
04/01/2024	03	00	31.068	16	13	29.48	5.7826648	5.0042010	34.09	-2.1	6.7
04/02/2024	03	01	22.452	16	17	14.83	5.7921570	5.0044342	34.04	-2.1	6.6
04/03/2024	03	02	14.104	16	21	00.27	5.8014772	5.0046679	33.98	-2.1	6.5
04/04/2024	03	03	06.018	16	24	45.73	5.8106238	5.0049020	33.93	-2.1	6.4
04/05/2024	03	03	58.188	16	28	31.18	5.8195951	5.0051365	33.88	-2.1	6.2
04/06/2024	03	04	50.608	16	32	16.55	5.8283897	5.0053715	33.83	-2.0	6.1
04/07/2024	03	05	43.274	16	36	01.80	5.8370058	5.0056069	33.78	-2.0	6.0
04/08/2024	03	06	36.181	16	39	46.89	5.8454419	5.0058427	33.73	-2.0	5.8

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		
04/09/2024	03	07	29.328	16	43	31.79	5.8536966	5.0060790	33.68	-2.0	5.7
04/10/2024	03	08	22.709	16	47	16.47	5.8617687	5.0063157	33.63	-2.0	5.6
04/11/2024	03	09	16.319	16	51	00.91	5.8696569	5.0065529	33.59	-2.0	5.4
04/12/2024	03	10	10.151	16	54	45.07	5.8773602	5.0067905	33.54	-2.0	5.3
04/13/2024	03	11	04.198	16	58	28.92	5.8848779	5.0070285	33.50	-2.0	5.2
04/14/2024	03	11	58.451	17	02	12.42	5.8922093	5.0072670	33.46	-2.0	5.0
04/15/2024	03	12	52.903	17	05	55.52	5.8993536	5.0075058	33.42	-2.0	4.9
04/16/2024	03	13	47.546	17	09	38.19	5.9063103	5.0077452	33.38	-2.0	4.7
04/17/2024	03	14	42.376	17	13	20.37	5.9130790	5.0079849	33.34	-2.0	4.6
04/18/2024	03	15	37.387	17	17	02.03	5.9196590	5.0082251	33.30	-2.0	4.4
04/19/2024	03	16	32.573	17	20	43.13	5.9260500	5.0084657	33.27	-2.0	4.3
04/20/2024	03	17	27.931	17	24	23.64	5.9322515	5.0087067	33.23	-2.0	4.2
04/21/2024	03	18	23.457	17	28	03.54	5.9382630	5.0089482	33.20	-2.0	4.0
04/22/2024	03	19	19.147	17	31	42.79	5.9440842	5.0091900	33.17	-2.0	3.9
04/23/2024	03	20	14.998	17	35	21.37	5.9497145	5.0094324	33.14	-2.0	3.8
04/24/2024	03	21	11.007	17	38	59.26	5.9551537	5.0096751	33.11	-2.0	3.6
04/25/2024	03	22	07.169	17	42	36.45	5.9604012	5.0099183	33.08	-2.0	3.5
04/26/2024	03	23	03.481	17	46	12.92	5.9654565	5.0101618	33.05	-2.0	3.4
04/27/2024	03	23	59.938	17	49	48.64	5.9703192	5.0104059	33.02	-2.0	3.2
04/28/2024	03	24	56.536	17	53	23.60	5.9749887	5.0106503	33.00	-2.0	3.1
04/29/2024	03	25	53.268	17	56	57.77	5.9794644	5.0108951	32.97	-2.0	3.0
04/30/2024	03	26	50.130	18	00	31.13	5.9837458	5.0111404	32.95	-2.0	2.8
05/01/2024	03	27	47.114	18	04	03.64	5.9878321	5.0113861	32.92	-2.0	2.7
05/02/2024	03	28	44.216	18	07	35.26	5.9917226	5.0116322	32.90	-2.0	2.5
05/03/2024	03	29	41.430	18	11	05.96	5.9954166	5.0118788	32.88	-2.0	2.4
05/04/2024	03	30	38.752	18	14	35.70	5.9989134	5.0121257	32.86	-2.0	2.2
05/05/2024	03	31	36.178	18	18	04.45	6.0022121	5.0123731	32.85	-2.0	2.1
05/06/2024	03	32	33.707	18	21	32.17	6.0053123	5.0126209	32.83	-2.0	1.9
05/07/2024	03	33	31.334	18	24	58.87	6.0082132	5.0128691	32.81	-2.0	1.8
05/08/2024	03	34	29.055	18	28	24.52	6.0109145	5.0131177	32.80	-2.0	1.6
05/09/2024	03	35	26.865	18	31	49.12	6.0134158	5.0133668	32.78	-2.0	1.5
05/10/2024	03	36	24.757	18	35	12.63	6.0157170	5.0136162	32.77	-2.0	1.3
05/11/2024	03	37	22.722	18	38	35.04	6.0178182	5.0138661	32.76	-2.0	1.2
05/12/2024	03	38	20.754	18	41	56.31	6.0197192	5.0141164	32.75	-2.0	1.0
05/13/2024	03	39	18.845	18	45	16.42	6.0214205	5.0143671	32.74	-2.0	0.9
05/14/2024	03	40	16.989	18	48	35.33	6.0229221	5.0146182	32.73	-2.0	0.7
05/15/2024	03	41	15.180	18	51	53.02	6.0242243	5.0148697	32.73	-2.0	0.6
05/16/2024	03	42	13.415	18	55	09.45	6.0253274	5.0151216	32.72	-2.0	0.4
05/17/2024	03	43	11.688	18	58	24.60	6.0262318	5.0153740	32.71	-2.0	0.3
05/18/2024	03	44	09.995	19	01	38.46	6.0269377	5.0156267	32.71	-2.0	0.2
05/19/2024	03	45	08.335	19	04	51.01	6.0274455	5.0158799	32.71	-2.0	0.1
05/20/2024	03	46	06.702	19	08	02.23	6.0277556	5.0161335	32.71	-2.0	0.2
05/21/2024	03	47	05.094	19	11	12.12	6.0278681	5.0163874	32.71	-2.0	0.3
05/22/2024	03	48	03.508	19	14	20.67	6.0277835	5.0166418	32.71	-2.0	0.5
05/23/2024	03	49	01.940	19	17	27.88	6.0275021	5.0168966	32.71	-2.0	0.6
05/24/2024	03	50	00.385	19	20	33.73	6.0270240	5.0171518	32.71	-2.0	0.7
05/25/2024	03	50	58.839	19	23	38.22	6.0263497	5.0174074	32.71	-2.0	0.9
05/26/2024	03	51	57.296	19	26	41.35	6.0254791	5.0176634	32.72	-2.0	1.0
05/27/2024	03	52	55.750	19	29	43.09	6.0244124	5.0179198	32.72	-2.0	1.1
05/28/2024	03	53	54.196	19	32	43.42	6.0231498	5.0181766	32.73	-2.0	1.3

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		
05/29/2024	03	54	52.627	19	35	42.32	6.0216911	5.0184338	32.74	-2.0	1.4
05/30/2024	03	55	51.039	19	38	39.76	6.0200364	5.0186914	32.75	-2.0	1.6
05/31/2024	03	56	49.427	19	41	35.72	6.0181856	5.0189495	32.76	-2.0	1.7
06/01/2024	03	57	47.788	19	44	30.18	6.0161387	5.0192079	32.77	-2.0	1.9
06/02/2024	03	58	46.118	19	47	23.12	6.0138957	5.0194667	32.78	-2.0	2.0
06/03/2024	03	59	44.415	19	50	14.54	6.0114567	5.0197259	32.79	-2.0	2.2
06/04/2024	04	00	42.674	19	53	04.42	6.0088218	5.0199855	32.81	-2.0	2.3
06/05/2024	04	01	40.890	19	55	52.78	6.0059914	5.0202455	32.82	-2.0	2.5
06/06/2024	04	02	39.056	19	58	39.60	6.0029658	5.0205059	32.84	-2.0	2.6
06/07/2024	04	03	37.165	20	01	24.88	5.9997456	5.0207667	32.86	-2.0	2.8
06/08/2024	04	04	35.208	20	04	08.60	5.9963315	5.0210279	32.88	-2.0	2.9
06/09/2024	04	05	33.179	20	06	50.75	5.9927242	5.0212895	32.90	-2.0	3.1
06/10/2024	04	06	31.069	20	09	31.30	5.9889247	5.0215515	32.92	-2.0	3.2
06/11/2024	04	07	28.872	20	12	10.23	5.9849337	5.0218139	32.94	-2.0	3.3
06/12/2024	04	08	26.584	20	14	47.53	5.9807522	5.0220766	32.96	-2.0	3.5
06/13/2024	04	09	24.198	20	17	23.18	5.9763812	5.0223398	32.99	-2.0	3.6
06/14/2024	04	10	21.712	20	19	57.18	5.9718217	5.0226034	33.01	-2.0	3.8
06/15/2024	04	11	19.120	20	22	29.52	5.9670747	5.0228673	33.04	-2.0	3.9
06/16/2024	04	12	16.420	20	25	00.19	5.9621412	5.0231316	33.07	-2.0	4.0
06/17/2024	04	13	13.607	20	27	29.20	5.9570222	5.0233964	33.09	-2.0	4.2
06/18/2024	04	14	10.676	20	29	56.55	5.9517187	5.0236615	33.12	-2.0	4.3
06/19/2024	04	15	07.625	20	32	22.24	5.9462316	5.0239270	33.15	-2.0	4.4
06/20/2024	04	16	04.449	20	34	46.27	5.9405620	5.0241929	33.19	-2.0	4.6
06/21/2024	04	17	01.143	20	37	08.66	5.9347107	5.0244591	33.22	-2.0	4.7
06/22/2024	04	17	57.700	20	39	29.41	5.9286787	5.0247258	33.25	-2.0	4.8
06/23/2024	04	18	54.114	20	41	48.51	5.9224668	5.0249928	33.29	-2.0	4.9
06/24/2024	04	19	50.379	20	44	05.96	5.9160757	5.0252603	33.32	-2.0	5.1
06/25/2024	04	20	46.489	20	46	21.75	5.9095062	5.0255281	33.36	-2.0	5.2
06/26/2024	04	21	42.436	20	48	35.86	5.9027589	5.0257963	33.40	-2.0	5.3
06/27/2024	04	22	38.216	20	50	48.27	5.8958344	5.0260648	33.44	-2.0	5.5
06/28/2024	04	23	33.825	20	52	58.97	5.8887333	5.0263338	33.48	-2.0	5.6
06/29/2024	04	24	29.259	20	55	07.96	5.8814562	5.0266031	33.52	-2.0	5.7
06/30/2024	04	25	24.514	20	57	15.24	5.8740039	5.0268729	33.56	-2.0	5.9
07/01/2024	04	26	19.586	20	59	20.81	5.8663772	5.0271430	33.61	-2.0	6.0
07/02/2024	04	27	14.469	21	01	24.69	5.8585769	5.0274135	33.65	-2.0	6.1
07/03/2024	04	28	09.156	21	03	26.88	5.8506041	5.0276843	33.70	-2.0	6.3
07/04/2024	04	29	03.638	21	05	27.39	5.8424599	5.0279556	33.74	-2.0	6.4
07/05/2024	04	29	57.907	21	07	26.22	5.8341456	5.0282272	33.79	-2.0	6.5
07/06/2024	04	30	51.955	21	09	23.36	5.8256625	5.0284992	33.84	-2.0	6.7
07/07/2024	04	31	45.772	21	11	18.81	5.8170120	5.0287716	33.89	-2.0	6.8
07/08/2024	04	32	39.351	21	13	12.56	5.8081959	5.0290443	33.94	-2.0	6.9
07/09/2024	04	33	32.686	21	15	04.60	5.7992155	5.0293174	34.00	-2.0	7.0
07/10/2024	04	34	25.769	21	16	54.93	5.7900727	5.0295909	34.05	-2.0	7.2
07/11/2024	04	35	18.597	21	18	43.55	5.7807690	5.0298648	34.10	-2.0	7.3
07/12/2024	04	36	11.162	21	20	30.45	5.7713061	5.0301390	34.16	-2.1	7.4
07/13/2024	04	37	03.461	21	22	15.64	5.7616859	5.0304137	34.22	-2.1	7.5
07/14/2024	04	37	55.489	21	23	59.14	5.7519099	5.0306887	34.27	-2.1	7.6
07/15/2024	04	38	47.241	21	25	40.96	5.7419799	5.0309640	34.33	-2.1	7.7
07/16/2024	04	39	38.710	21	27	21.11	5.7318977	5.0312397	34.39	-2.1	7.8
07/17/2024	04	40	29.893	21	28	59.60	5.7216650	5.0315158	34.46	-2.1	7.9

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		
07/18/2024	04	41	20.783	21	30	36.45	5.7112834	5.0317923	34.52	-2.1	8.0
07/19/2024	04	42	11.374	21	32	11.67	5.7007547	5.0320691	34.58	-2.1	8.1
07/20/2024	04	43	01.658	21	33	45.29	5.6900804	5.0323464	34.65	-2.1	8.2
07/21/2024	04	43	51.627	21	35	17.31	5.6792622	5.0326239	34.71	-2.1	8.3
07/22/2024	04	44	41.275	21	36	47.72	5.6683015	5.0329019	34.78	-2.1	8.4
07/23/2024	04	45	30.592	21	38	16.52	5.6571998	5.0331802	34.85	-2.1	8.5
07/24/2024	04	46	19.573	21	39	43.70	5.6459584	5.0334588	34.92	-2.1	8.6
07/25/2024	04	47	08.213	21	41	09.26	5.6345788	5.0337379	34.99	-2.1	8.7
07/26/2024	04	47	56.506	21	42	33.20	5.6230622	5.0340173	35.06	-2.1	8.8
07/27/2024	04	48	44.448	21	43	55.53	5.6114101	5.0342970	35.13	-2.1	8.9
07/28/2024	04	49	32.033	21	45	16.26	5.5996240	5.0345771	35.21	-2.1	9.1
07/29/2024	04	50	19.255	21	46	35.41	5.5877056	5.0348576	35.28	-2.1	9.2
07/30/2024	04	51	06.106	21	47	53.02	5.5756566	5.0351385	35.36	-2.1	9.3
07/31/2024	04	51	52.575	21	49	09.08	5.5634788	5.0354197	35.44	-2.1	9.4
08/01/2024	04	52	38.654	21	50	23.62	5.5511743	5.0357012	35.51	-2.1	9.4
08/02/2024	04	53	24.333	21	51	36.63	5.5387453	5.0359832	35.59	-2.1	9.5
08/03/2024	04	54	09.601	21	52	48.13	5.5261938	5.0362654	35.67	-2.1	9.6
08/04/2024	04	54	54.449	21	53	58.12	5.5135224	5.0365481	35.76	-2.1	9.7
08/05/2024	04	55	38.869	21	55	06.60	5.5007333	5.0368311	35.84	-2.1	9.8
08/06/2024	04	56	22.854	21	56	13.57	5.4878290	5.0371144	35.92	-2.1	9.9
08/07/2024	04	57	06.395	21	57	19.04	5.4748121	5.0373981	36.01	-2.1	10.0
08/08/2024	04	57	49.487	21	58	23.01	5.4616850	5.0376822	36.10	-2.2	10.1
08/09/2024	04	58	32.122	21	59	25.51	5.4484505	5.0379666	36.18	-2.2	10.1
08/10/2024	04	59	14.296	22	00	26.54	5.4351111	5.0382514	36.27	-2.2	10.2
08/11/2024	04	59	56.001	22	01	26.13	5.4216694	5.0385365	36.36	-2.2	10.3
08/12/2024	05	00	37.231	22	02	24.30	5.4081281	5.0388220	36.45	-2.2	10.3
08/13/2024	05	01	17.979	22	03	21.07	5.3944898	5.0391078	36.55	-2.2	10.4
08/14/2024	05	01	58.239	22	04	16.46	5.3807571	5.0393939	36.64	-2.2	10.5
08/15/2024	05	02	38.003	22	05	10.50	5.3669327	5.0396805	36.73	-2.2	10.5
08/16/2024	05	03	17.263	22	06	03.20	5.3530193	5.0399673	36.83	-2.2	10.6
08/17/2024	05	03	56.011	22	06	54.60	5.3390193	5.0402546	36.93	-2.2	10.6
08/18/2024	05	04	34.236	22	07	44.69	5.3249354	5.0405421	37.02	-2.2	10.7
08/19/2024	05	05	11.932	22	08	33.48	5.3107699	5.0408300	37.12	-2.2	10.7
08/20/2024	05	05	49.089	22	09	20.98	5.2965253	5.0411183	37.22	-2.2	10.8
08/21/2024	05	06	25.700	22	10	07.18	5.2822039	5.0414069	37.32	-2.2	10.8
08/22/2024	05	07	01.760	22	10	52.08	5.2678080	5.0416958	37.42	-2.2	10.9
08/23/2024	05	07	37.263	22	11	35.69	5.2533400	5.0419851	37.53	-2.2	11.0
08/24/2024	05	08	12.204	22	12	18.03	5.2388023	5.0422748	37.63	-2.2	11.0
08/25/2024	05	08	46.575	22	12	59.14	5.2241975	5.0425647	37.74	-2.2	11.1
08/26/2024	05	09	20.368	22	13	39.04	5.2095284	5.0428551	37.84	-2.3	11.1
08/27/2024	05	09	53.571	22	14	17.75	5.1947977	5.0431457	37.95	-2.3	11.2
08/28/2024	05	10	26.175	22	14	55.29	5.1800084	5.0434367	38.06	-2.3	11.2
08/29/2024	05	10	58.168	22	15	31.67	5.1651638	5.0437281	38.17	-2.3	11.2
08/30/2024	05	11	29.539	22	16	06.91	5.1502669	5.0440197	38.28	-2.3	11.3
08/31/2024	05	12	00.279	22	16	41.02	5.1353212	5.0443117	38.39	-2.3	11.3
09/01/2024	05	12	30.378	22	17	13.99	5.1203302	5.0446041	38.50	-2.3	11.3
09/02/2024	05	12	59.828	22	17	45.84	5.1052972	5.0448968	38.62	-2.3	11.4
09/03/2024	05	13	28.619	22	18	16.57	5.0902260	5.0451898	38.73	-2.3	11.4
09/04/2024	05	13	56.746	22	18	46.19	5.0751201	5.0454832	38.85	-2.3	11.4
09/05/2024	05	14	24.201	22	19	14.73	5.0599833	5.0457768	38.96	-2.3	11.4

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		
09/06/2024	05	14	50.978	22	19	42.19	5.0448193	5.0460709	39.08	-2.3	11.4
09/07/2024	05	15	17.069	22	20	08.60	5.0296318	5.0463652	39.20	-2.3	11.4
09/08/2024	05	15	42.469	22	20	33.98	5.0144246	5.0466599	39.32	-2.3	11.5
09/09/2024	05	16	07.171	22	20	58.35	4.9992015	5.0469549	39.44	-2.3	11.5
09/10/2024	05	16	31.168	22	21	21.73	4.9839662	5.0472503	39.56	-2.3	11.5
09/11/2024	05	16	54.453	22	21	44.16	4.9687227	5.0475459	39.68	-2.3	11.4
09/12/2024	05	17	17.017	22	22	05.64	4.9534746	5.0478420	39.80	-2.4	11.4
09/13/2024	05	17	38.854	22	22	26.21	4.9382258	5.0481383	39.92	-2.4	11.4
09/14/2024	05	17	59.956	22	22	45.87	4.9229799	5.0484349	40.05	-2.4	11.4
09/15/2024	05	18	20.313	22	23	04.63	4.9077407	5.0487319	40.17	-2.4	11.4
09/16/2024	05	18	39.919	22	23	22.50	4.8925118	5.0490292	40.30	-2.4	11.4
09/17/2024	05	18	58.766	22	23	39.47	4.8772967	5.0493269	40.42	-2.4	11.4
09/18/2024	05	19	16.850	22	23	55.53	4.8620990	5.0496248	40.55	-2.4	11.4
09/19/2024	05	19	34.166	22	24	10.70	4.8469222	5.0499231	40.67	-2.4	11.3
09/20/2024	05	19	50.711	22	24	24.97	4.8317697	5.0502217	40.80	-2.4	11.3
09/21/2024	05	20	06.479	22	24	38.37	4.8166453	5.0505207	40.93	-2.4	11.3
09/22/2024	05	20	21.463	22	24	50.93	4.8015527	5.0508199	41.06	-2.4	11.3
09/23/2024	05	20	35.656	22	25	02.67	4.7864959	5.0511195	41.19	-2.4	11.2
09/24/2024	05	20	49.049	22	25	13.62	4.7714790	5.0514194	41.32	-2.4	11.2
09/25/2024	05	21	01.631	22	25	23.76	4.7565062	5.0517196	41.45	-2.4	11.2
09/26/2024	05	21	13.394	22	25	33.13	4.7415818	5.0520201	41.58	-2.5	11.1
09/27/2024	05	21	24.331	22	25	41.70	4.7267104	5.0523210	41.71	-2.5	11.1
09/28/2024	05	21	34.434	22	25	49.49	4.7118965	5.0526221	41.84	-2.5	11.1
09/29/2024	05	21	43.698	22	25	56.49	4.6971447	5.0529236	41.97	-2.5	11.0
09/30/2024	05	21	52.118	22	26	02.71	4.6824598	5.0532254	42.10	-2.5	11.0
10/01/2024	05	21	59.689	22	26	08.14	4.6678464	5.0535275	42.23	-2.5	10.9
10/02/2024	05	22	06.408	22	26	12.79	4.6533094	5.0538299	42.37	-2.5	10.8
10/03/2024	05	22	12.273	22	26	16.68	4.6388537	5.0541327	42.50	-2.5	10.8
10/04/2024	05	22	17.282	22	26	19.80	4.6244839	5.0544357	42.63	-2.5	10.7
10/05/2024	05	22	21.431	22	26	22.17	4.6102050	5.0547391	42.76	-2.5	10.6
10/06/2024	05	22	24.719	22	26	23.80	4.5960218	5.0550428	42.89	-2.5	10.5
10/07/2024	05	22	27.145	22	26	24.71	4.5819391	5.0553467	43.03	-2.5	10.4
10/08/2024	05	22	28.707	22	26	24.92	4.5679617	5.0556510	43.16	-2.5	10.4
10/09/2024	05	22	29.402	22	26	24.42	4.5540945	5.0559556	43.29	-2.5	10.3
10/10/2024	05	22	29.230	22	26	23.23	4.5403421	5.0562605	43.42	-2.5	10.2
10/11/2024	05	22	28.187	22	26	21.36	4.5267092	5.0565658	43.55	-2.6	10.1
10/12/2024	05	22	26.274	22	26	18.80	4.5132005	5.0568713	43.68	-2.6	10.0
10/13/2024	05	22	23.489	22	26	15.55	4.4998204	5.0571771	43.81	-2.6	9.9
10/14/2024	05	22	19.832	22	26	11.59	4.4865735	5.0574832	43.94	-2.6	9.8
10/15/2024	05	22	15.305	22	26	06.90	4.4734642	5.0577897	44.07	-2.6	9.7
10/16/2024	05	22	09.912	22	26	01.48	4.4604966	5.0580964	44.20	-2.6	9.6
10/17/2024	05	22	03.655	22	25	55.31	4.4476752	5.0584035	44.33	-2.6	9.5
10/18/2024	05	21	56.541	22	25	48.41	4.4350041	5.0587108	44.45	-2.6	9.3
10/19/2024	05	21	48.571	22	25	40.77	4.4224878	5.0590184	44.58	-2.6	9.2
10/20/2024	05	21	39.747	22	25	32.42	4.4101307	5.0593264	44.70	-2.6	9.1
10/21/2024	05	21	30.070	22	25	23.37	4.3979373	5.0596346	44.83	-2.6	9.0
10/22/2024	05	21	19.540	22	25	13.61	4.3859125	5.0599432	44.95	-2.6	8.9
10/23/2024	05	21	08.157	22	25	03.14	4.3740609	5.0602520	45.07	-2.6	8.7
10/24/2024	05	20	55.925	22	24	51.95	4.3623876	5.0605611	45.19	-2.6	8.6
10/25/2024	05	20	42.845	22	24	40.02	4.3508973	5.0608706	45.31	-2.6	8.5

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		
10/26/2024	05	20	28.924	22	24	27.33	4.3395950	5.0611803	45.43	-2.7	8.3
10/27/2024	05	20	14.168	22	24	13.89	4.3284857	5.0614903	45.55	-2.7	8.2
10/28/2024	05	19	58.586	22	23	59.68	4.3175744	5.0618006	45.66	-2.7	8.1
10/29/2024	05	19	42.185	22	23	44.69	4.3068658	5.0621112	45.77	-2.7	7.9
10/30/2024	05	19	24.976	22	23	28.92	4.2963649	5.0624221	45.89	-2.7	7.7
10/31/2024	05	19	06.970	22	23	12.38	4.2860765	5.0627333	46.00	-2.7	7.6
11/01/2024	05	18	48.177	22	22	55.05	4.2760054	5.0630448	46.11	-2.7	7.4
11/02/2024	05	18	28.611	22	22	36.96	4.2661562	5.0633565	46.21	-2.7	7.3
11/03/2024	05	18	08.283	22	22	18.10	4.2565335	5.0636686	46.32	-2.7	7.1
11/04/2024	05	17	47.206	22	21	58.48	4.2471418	5.0639809	46.42	-2.7	6.9
11/05/2024	05	17	25.393	22	21	38.11	4.2379855	5.0642936	46.52	-2.7	6.7
11/06/2024	05	17	02.857	22	21	16.99	4.2290689	5.0646065	46.62	-2.7	6.5
11/07/2024	05	16	39.611	22	20	55.12	4.2203960	5.0649197	46.71	-2.7	6.4
11/08/2024	05	16	15.671	22	20	32.50	4.2119708	5.0652332	46.81	-2.7	6.2
11/09/2024	05	15	51.051	22	20	09.12	4.2037971	5.0655469	46.90	-2.7	6.0
11/10/2024	05	15	25.767	22	19	44.97	4.1958787	5.0658610	46.99	-2.7	5.8
11/11/2024	05	14	59.836	22	19	20.04	4.1882188	5.0661753	47.07	-2.7	5.6
11/12/2024	05	14	33.277	22	18	54.32	4.1808209	5.0664899	47.15	-2.7	5.4
11/13/2024	05	14	06.111	22	18	27.79	4.1736882	5.0668048	47.24	-2.8	5.2
11/14/2024	05	13	38.358	22	18	00.46	4.1668237	5.0671200	47.31	-2.8	5.0
11/15/2024	05	13	10.039	22	17	32.36	4.1602305	5.0674355	47.39	-2.8	4.9
11/16/2024	05	12	41.173	22	17	03.48	4.1539115	5.0677512	47.46	-2.8	4.7
11/17/2024	05	12	11.778	22	16	33.87	4.1478697	5.0680672	47.53	-2.8	4.5
11/18/2024	05	11	41.871	22	16	03.52	4.1421082	5.0683835	47.60	-2.8	4.3
11/19/2024	05	11	11.470	22	15	32.45	4.1366299	5.0687000	47.66	-2.8	4.1
11/20/2024	05	10	40.591	22	15	00.65	4.1314381	5.0690169	47.72	-2.8	3.9
11/21/2024	05	10	09.256	22	14	28.14	4.1265355	5.0693340	47.78	-2.8	3.7
11/22/2024	05	09	37.486	22	13	54.90	4.1219253	5.0696514	47.83	-2.8	3.5
11/23/2024	05	09	05.303	22	13	20.95	4.1176102	5.0699690	47.88	-2.8	3.3
11/24/2024	05	08	32.732	22	12	46.28	4.1135928	5.0702869	47.93	-2.8	3.0
11/25/2024	05	07	59.798	22	12	10.93	4.1098759	5.0706051	47.97	-2.8	2.8
11/26/2024	05	07	26.528	22	11	34.89	4.1064618	5.0709236	48.01	-2.8	2.6
11/27/2024	05	06	52.948	22	10	58.21	4.1033529	5.0712423	48.05	-2.8	2.4
11/28/2024	05	06	19.084	22	10	20.90	4.1005511	5.0715613	48.08	-2.8	2.2
11/29/2024	05	05	44.965	22	09	42.99	4.0980585	5.0718806	48.11	-2.8	1.9
11/30/2024	05	05	10.617	22	09	04.52	4.0958769	5.0722001	48.13	-2.8	1.7
12/01/2024	05	04	36.069	22	08	25.53	4.0940077	5.0725199	48.15	-2.8	1.5
12/02/2024	05	04	01.347	22	07	46.05	4.0924524	5.0728400	48.17	-2.8	1.3
12/03/2024	05	03	26.478	22	07	06.12	4.0912121	5.0731603	48.19	-2.8	1.0
12/04/2024	05	02	51.490	22	06	25.77	4.0902876	5.0734809	48.20	-2.8	0.8
12/05/2024	05	02	16.408	22	05	45.04	4.0896797	5.0738018	48.21	-2.8	0.6
12/06/2024	05	01	41.261	22	05	03.94	4.0893888	5.0741229	48.21	-2.8	0.4
12/07/2024	05	01	06.075	22	04	22.50	4.0894150	5.0744443	48.21	-2.8	0.2
12/08/2024	05	00	30.879	22	03	40.74	4.0897584	5.0747659	48.20	-2.8	0.2
12/09/2024	04	59	55.701	22	02	58.70	4.0904185	5.0750878	48.20	-2.8	0.4
12/10/2024	04	59	20.572	22	02	16.40	4.0913951	5.0754099	48.19	-2.8	0.6
12/11/2024	04	58	45.521	22	01	33.88	4.0926874	5.0757323	48.17	-2.8	0.8
12/12/2024	04	58	10.575	22	00	51.19	4.0942947	5.0760550	48.15	-2.8	1.0
12/13/2024	04	57	35.764	22	00	08.39	4.0962161	5.0763779	48.13	-2.8	1.2
12/14/2024	04	57	01.112	21	59	25.52	4.0984507	5.0767011	48.10	-2.8	1.4

Jupiter - 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.
12/15/2024	04 56 26.643	21 58 42.64	4.1009977	5.0770245	48.07	-2.8	1.6
12/16/2024	04 55 52.380	21 57 59.79	4.1038558	5.0773482	48.04	-2.8	1.9
12/17/2024	04 55 18.346	21 57 17.03	4.1070243	5.0776721	48.00	-2.8	2.1
12/18/2024	04 54 44.562	21 56 34.38	4.1105018	5.0779963	47.96	-2.8	2.3
12/19/2024	04 54 11.054	21 55 51.88	4.1142874	5.0783207	47.92	-2.8	2.5
12/20/2024	04 53 37.844	21 55 09.56	4.1183798	5.0786454	47.87	-2.8	2.7
12/21/2024	04 53 04.959	21 54 27.47	4.1227775	5.0789704	47.82	-2.8	2.9
12/22/2024	04 52 32.425	21 53 45.65	4.1274790	5.0792955	47.76	-2.8	3.1
12/23/2024	04 52 00.267	21 53 04.15	4.1324825	5.0796210	47.71	-2.8	3.3
12/24/2024	04 51 28.510	21 52 23.03	4.1377863	5.0799467	47.65	-2.8	3.6
12/25/2024	04 50 57.180	21 51 42.35	4.1433882	5.0802726	47.58	-2.8	3.8
12/26/2024	04 50 26.301	21 51 02.15	4.1492861	5.0805987	47.51	-2.8	4.0
12/27/2024	04 49 55.896	21 50 22.50	4.1554777	5.0809252	47.44	-2.8	4.2
12/28/2024	04 49 25.989	21 49 43.47	4.1619602	5.0812518	47.37	-2.8	4.4
12/29/2024	04 48 56.601	21 49 05.10	4.1687311	5.0815787	47.29	-2.7	4.6
12/30/2024	04 48 27.754	21 48 27.47	4.1757875	5.0819059	47.21	-2.7	4.8
12/31/2024	04 47 59.468	21 47 50.62	4.1831261	5.0822333	47.13	-2.7	5.0
01/01/2025	04 47 31.761	21 47 14.59	4.1907437	5.0825609	47.04	-2.7	5.2



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.
12/31/2023	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
01/03/2024	22	23	47.481	-11	46	18.79	10.3209015	9.7372775	16.10	0.9	4.5
01/04/2024	22	24	08.210	-11	44	15.64	10.3337579	9.7369948	16.08	0.9	4.4
01/05/2024	22	24	29.185	-11	42	11.07	10.3464440	9.7367120	16.06	0.9	4.4
01/06/2024	22	24	50.403	-11	40	05.10	10.3589565	9.7364291	16.04	0.9	4.3
01/07/2024	22	25	11.861	-11	37	57.74	10.3712920	9.7361462	16.02	0.9	4.3
01/08/2024	22	25	33.557	-11	35	49.03	10.3834471	9.7358632	16.01	0.9	4.2
01/09/2024	22	25	55.485	-11	33	38.98	10.3954187	9.7355801	15.99	0.9	4.1
01/10/2024	22	26	17.641	-11	31	27.63	10.4072033	9.7352969	15.97	0.9	4.1
01/11/2024	22	26	40.018	-11	29	15.01	10.4187977	9.7350137	15.95	0.9	4.0
01/12/2024	22	27	02.610	-11	27	01.17	10.4301988	9.7347304	15.93	0.9	3.9
01/13/2024	22	27	25.409	-11	24	46.13	10.4414034	9.7344471	15.92	0.9	3.9
01/14/2024	22	27	48.409	-11	22	29.93	10.4524087	9.7341636	15.90	0.9	3.8
01/15/2024	22	28	11.605	-11	20	12.58	10.4632119	9.7338802	15.88	0.9	3.7
01/16/2024	22	28	34.993	-11	17	54.10	10.4738104	9.7335966	15.87	0.9	3.6
01/17/2024	22	28	58.571	-11	15	34.51	10.4842020	9.7333130	15.85	0.9	3.6
01/18/2024	22	29	22.336	-11	13	13.81	10.4943844	9.7330293	15.84	0.9	3.5
01/19/2024	22	29	46.284	-11	10	52.03	10.5043555	9.7327455	15.82	0.9	3.4
01/20/2024	22	30	10.412	-11	08	29.20	10.5141134	9.7324617	15.81	0.9	3.3
01/21/2024	22	30	34.714	-11	06	05.35	10.5236562	9.7321778	15.79	0.9	3.3
01/22/2024	22	30	59.186	-11	03	40.51	10.5329820	9.7318938	15.78	0.9	3.2
01/23/2024	22	31	23.822	-11	01	14.72	10.5420890	9.7316098	15.76	0.9	3.1
01/24/2024	22	31	48.616	-10	58	48.01	10.5509755	9.7313257	15.75	0.9	3.0
01/25/2024	22	32	13.562	-10	56	20.41	10.5596398	9.7310415	15.74	0.9	3.0
01/26/2024	22	32	38.656	-10	53	51.94	10.5680800	9.7307573	15.73	0.9	2.9
01/27/2024	22	33	03.893	-10	51	22.63	10.5762945	9.7304730	15.71	0.9	2.8
01/28/2024	22	33	29.269	-10	48	52.50	10.5842814	9.7301886	15.70	0.9	2.7
01/29/2024	22	33	54.779	-10	46	21.56	10.5920391	9.7299042	15.69	0.9	2.7
01/30/2024	22	34	20.421	-10	43	49.83	10.5995658	9.7296197	15.68	0.9	2.6
01/31/2024	22	34	46.191	-10	41	17.32	10.6068598	9.7293351	15.67	0.9	2.5
02/01/2024	22	35	12.086	-10	38	44.06	10.6139193	9.7290505	15.66	0.9	2.4
02/02/2024	22	35	38.104	-10	36	10.06	10.6207428	9.7287658	15.65	0.9	2.3
02/03/2024	22	36	04.240	-10	33	35.34	10.6273284	9.7284810	15.64	0.9	2.3
02/04/2024	22	36	30.492	-10	30	59.92	10.6336745	9.7281962	15.63	0.9	2.2
02/05/2024	22	36	56.855	-10	28	23.83	10.6397794	9.7279113	15.62	0.9	2.1
02/06/2024	22	37	23.324	-10	25	47.11	10.6456415	9.7276263	15.61	0.9	2.0
02/07/2024	22	37	49.895	-10	23	09.78	10.6512591	9.7273412	15.60	0.9	1.9
02/08/2024	22	38	16.560	-10	20	31.88	10.6566308	9.7270561	15.60	0.9	1.8
02/09/2024	22	38	43.313	-10	17	53.47	10.6617549	9.7267710	15.59	0.9	1.7
02/10/2024	22	39	10.147	-10	15	14.56	10.6666302	9.7264857	15.58	0.9	1.7
02/11/2024	22	39	37.055	-10	12	35.19	10.6712553	9.7262004	15.57	0.9	1.6
02/12/2024	22	40	04.035	-10	09	55.37	10.6756294	9.7259151	15.57	0.9	1.5
02/13/2024	22	40	31.082	-10	07	15.13	10.6797515	9.7256296	15.56	0.9	1.4
02/14/2024	22	40	58.195	-10	04	34.47	10.6836212	9.7253441	15.56	0.9	1.3
02/15/2024	22	41	25.371	-10	01	53.41	10.6872378	9.7250585	15.55	0.9	1.2
02/16/2024	22	41	52.605	-09	59	11.99	10.6906011	9.7247729	15.55	0.9	1.1
02/17/2024	22	42	19.894	-09	56	30.24	10.6937109	9.7244872	15.54	0.9	1.0
02/18/2024	22	42	47.232	-09	53	48.20	10.6965668	9.7242014	15.54	0.9	0.9

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		
02/19/2024	22	43	14.614	-09	51	05.89	10.6991689	9.7239156	15.53	0.9	0.9
02/20/2024	22	43	42.035	-09	48	23.36	10.7015169	9.7236297	15.53	0.9	0.8
02/21/2024	22	44	09.487	-09	45	40.63	10.7036107	9.7233437	15.53	0.9	0.7
02/22/2024	22	44	36.968	-09	42	57.73	10.7054503	9.7230577	15.52	0.9	0.6
02/23/2024	22	45	04.472	-09	40	14.70	10.7070355	9.7227716	15.52	0.9	0.5
02/24/2024	22	45	31.995	-09	37	31.54	10.7083662	9.7224854	15.52	0.9	0.4
02/25/2024	22	45	59.534	-09	34	48.28	10.7094424	9.7221992	15.52	1.0	0.4
02/26/2024	22	46	27.085	-09	32	04.94	10.7102640	9.7219129	15.52	1.0	0.3
02/27/2024	22	46	54.645	-09	29	21.54	10.7108308	9.7216265	15.52	1.0	0.2
02/28/2024	22	47	22.211	-09	26	38.09	10.7111428	9.7213401	15.52	1.0	0.2
02/29/2024	22	47	49.781	-09	23	54.61	10.7111999	9.7210536	15.52	1.0	0.2
03/01/2024	22	48	17.351	-09	21	11.12	10.7110020	9.7207671	15.52	1.0	0.2
03/02/2024	22	48	44.918	-09	18	27.64	10.7105492	9.7204804	15.52	1.0	0.3
03/03/2024	22	49	12.479	-09	15	44.21	10.7098413	9.7201937	15.52	1.0	0.3
03/04/2024	22	49	40.029	-09	13	00.84	10.7088783	9.7199070	15.52	1.0	0.4
03/05/2024	22	50	07.564	-09	10	17.58	10.7076602	9.7196202	15.52	1.0	0.5
03/06/2024	22	50	35.077	-09	07	34.46	10.7061871	9.7193333	15.52	1.0	0.6
03/07/2024	22	51	02.563	-09	04	51.52	10.7044591	9.7190463	15.53	1.0	0.7
03/08/2024	22	51	30.014	-09	02	08.80	10.7024762	9.7187593	15.53	1.0	0.8
03/09/2024	22	51	57.427	-08	59	26.33	10.7002388	9.7184722	15.53	1.0	0.9
03/10/2024	22	52	24.794	-08	56	44.13	10.6977473	9.7181851	15.54	1.0	1.0
03/11/2024	22	52	52.114	-08	54	02.23	10.6950024	9.7178978	15.54	1.0	1.0
03/12/2024	22	53	19.383	-08	51	20.63	10.6920048	9.7176106	15.54	1.0	1.1
03/13/2024	22	53	46.601	-08	48	39.35	10.6887557	9.7173232	15.55	1.0	1.2
03/14/2024	22	54	13.763	-08	45	58.42	10.6852561	9.7170358	15.55	1.1	1.3
03/15/2024	22	54	40.867	-08	43	17.88	10.6815074	9.7167483	15.56	1.1	1.4
03/16/2024	22	55	07.906	-08	40	37.75	10.6775110	9.7164608	15.56	1.1	1.5
03/17/2024	22	55	34.876	-08	37	58.07	10.6732681	9.7161732	15.57	1.1	1.6
03/18/2024	22	56	01.772	-08	35	18.89	10.6687803	9.7158855	15.58	1.1	1.7
03/19/2024	22	56	28.587	-08	32	40.22	10.6640489	9.7155978	15.58	1.1	1.7
03/20/2024	22	56	55.318	-08	30	02.11	10.6590754	9.7153100	15.59	1.1	1.8
03/21/2024	22	57	21.960	-08	27	24.58	10.6538612	9.7150221	15.60	1.1	1.9
03/22/2024	22	57	48.509	-08	24	47.64	10.6484076	9.7147342	15.61	1.1	2.0
03/23/2024	22	58	14.962	-08	22	11.33	10.6427161	9.7144462	15.62	1.1	2.1
03/24/2024	22	58	41.316	-08	19	35.66	10.6367881	9.7141582	15.62	1.1	2.2
03/25/2024	22	59	07.567	-08	17	00.64	10.6306250	9.7138701	15.63	1.1	2.2
03/26/2024	22	59	33.714	-08	14	26.30	10.6242282	9.7135819	15.64	1.1	2.3
03/27/2024	22	59	59.754	-08	11	52.64	10.6175991	9.7132937	15.65	1.1	2.4
03/28/2024	23	00	25.683	-08	09	19.70	10.6107391	9.7130054	15.66	1.1	2.5
03/29/2024	23	00	51.501	-08	06	47.48	10.6036495	9.7127170	15.67	1.1	2.6
03/30/2024	23	01	17.202	-08	04	16.03	10.5963318	9.7124286	15.68	1.1	2.6
03/31/2024	23	01	42.783	-08	01	45.35	10.5887873	9.7121401	15.70	1.1	2.7
04/01/2024	23	02	08.240	-07	59	15.50	10.5810176	9.7118515	15.71	1.1	2.8
04/02/2024	23	02	33.567	-07	56	46.49	10.5730240	9.7115629	15.72	1.1	2.9
04/03/2024	23	02	58.760	-07	54	18.37	10.5648080	9.7112742	15.73	1.1	3.0
04/04/2024	23	03	23.812	-07	51	51.17	10.5563711	9.7109855	15.74	1.1	3.1
04/05/2024	23	03	48.717	-07	49	24.93	10.5477151	9.7106967	15.76	1.1	3.1
04/06/2024	23	04	13.472	-07	46	59.68	10.5388416	9.7104078	15.77	1.1	3.2
04/07/2024	23	04	38.072	-07	44	35.43	10.5297526	9.7101189	15.78	1.2	3.3
04/08/2024	23	05	02.515	-07	42	12.21	10.5204501	9.7098299	15.80	1.2	3.4

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		
04/09/2024	23	05	26.799	-07	39	50.02	10.5109363	9.7095408	15.81	1.2	3.5
04/10/2024	23	05	50.921	-07	37	28.88	10.5012138	9.7092517	15.83	1.2	3.5
04/11/2024	23	06	14.879	-07	35	08.82	10.4912851	9.7089625	15.84	1.2	3.6
04/12/2024	23	06	38.669	-07	32	49.88	10.4811528	9.7086733	15.86	1.2	3.7
04/13/2024	23	07	02.286	-07	30	32.09	10.4708198	9.7083840	15.87	1.2	3.8
04/14/2024	23	07	25.723	-07	28	15.49	10.4602887	9.7080946	15.89	1.2	3.8
04/15/2024	23	07	48.977	-07	26	00.12	10.4495623	9.7078052	15.90	1.2	3.9
04/16/2024	23	08	12.042	-07	23	45.99	10.4386434	9.7075157	15.92	1.2	4.0
04/17/2024	23	08	34.913	-07	21	33.14	10.4275346	9.7072261	15.94	1.2	4.0
04/18/2024	23	08	57.589	-07	19	21.59	10.4162387	9.7069365	15.96	1.2	4.1
04/19/2024	23	09	20.064	-07	17	11.36	10.4047584	9.7066468	15.97	1.2	4.2
04/20/2024	23	09	42.338	-07	15	02.46	10.3930963	9.7063571	15.99	1.2	4.2
04/21/2024	23	10	04.406	-07	12	54.91	10.3812552	9.7060673	16.01	1.2	4.3
04/22/2024	23	10	26.268	-07	10	48.72	10.3692376	9.7057775	16.03	1.2	4.3
04/23/2024	23	10	47.920	-07	08	43.92	10.3570463	9.7054875	16.05	1.2	4.4
04/24/2024	23	11	09.360	-07	06	40.51	10.3446839	9.7051976	16.07	1.2	4.5
04/25/2024	23	11	30.587	-07	04	38.52	10.3321529	9.7049075	16.09	1.2	4.5
04/26/2024	23	11	51.597	-07	02	37.96	10.3194561	9.7046174	16.10	1.2	4.6
04/27/2024	23	12	12.387	-07	00	38.86	10.3065959	9.7043272	16.13	1.2	4.6
04/28/2024	23	12	32.953	-06	58	41.25	10.2935751	9.7040370	16.15	1.2	4.7
04/29/2024	23	12	53.290	-06	56	45.15	10.2803962	9.7037467	16.17	1.2	4.8
04/30/2024	23	13	13.393	-06	54	50.61	10.2670619	9.7034564	16.19	1.2	4.8
05/01/2024	23	13	33.257	-06	52	57.66	10.2535749	9.7031660	16.21	1.2	4.9
05/02/2024	23	13	52.878	-06	51	06.32	10.2399380	9.7028755	16.23	1.2	4.9
05/03/2024	23	14	12.250	-06	49	16.62	10.2261540	9.7025850	16.25	1.2	5.0
05/04/2024	23	14	31.369	-06	47	28.59	10.2122260	9.7022944	16.27	1.2	5.0
05/05/2024	23	14	50.235	-06	45	42.24	10.1981570	9.7020037	16.30	1.2	5.1
05/06/2024	23	15	08.844	-06	43	57.58	10.1839505	9.7017130	16.32	1.2	5.2
05/07/2024	23	15	27.195	-06	42	14.62	10.1696097	9.7014223	16.34	1.2	5.2
05/08/2024	23	15	45.285	-06	40	33.39	10.1551384	9.7011314	16.37	1.2	5.3
05/09/2024	23	16	03.113	-06	38	53.91	10.1405403	9.7008406	16.39	1.2	5.3
05/10/2024	23	16	20.673	-06	37	16.20	10.1258192	9.7005496	16.41	1.2	5.3
05/11/2024	23	16	37.960	-06	35	40.31	10.1109789	9.7002586	16.44	1.2	5.4
05/12/2024	23	16	54.970	-06	34	06.27	10.0960234	9.6999675	16.46	1.2	5.4
05/13/2024	23	17	11.698	-06	32	34.10	10.0809564	9.6996764	16.49	1.2	5.5
05/14/2024	23	17	28.140	-06	31	03.83	10.0657817	9.6993852	16.51	1.2	5.5
05/15/2024	23	17	44.293	-06	29	35.47	10.0505033	9.6990940	16.54	1.2	5.5
05/16/2024	23	18	00.154	-06	28	09.05	10.0351247	9.6988027	16.56	1.2	5.6
05/17/2024	23	18	15.721	-06	26	44.56	10.0196498	9.6985113	16.59	1.2	5.6
05/18/2024	23	18	30.993	-06	25	22.03	10.0040823	9.6982199	16.61	1.2	5.6
05/19/2024	23	18	45.967	-06	24	01.46	9.9884259	9.6979284	16.64	1.2	5.7
05/20/2024	23	19	00.642	-06	22	42.86	9.9726842	9.6976369	16.66	1.2	5.7
05/21/2024	23	19	15.017	-06	21	26.24	9.9568609	9.6973453	16.69	1.2	5.7
05/22/2024	23	19	29.089	-06	20	11.61	9.9409596	9.6970536	16.72	1.2	5.8
05/23/2024	23	19	42.858	-06	18	58.98	9.9249839	9.6967619	16.75	1.2	5.8
05/24/2024	23	19	56.320	-06	17	48.38	9.9089373	9.6964702	16.77	1.2	5.8
05/25/2024	23	20	09.473	-06	16	39.81	9.8928235	9.6961783	16.80	1.2	5.8
05/26/2024	23	20	22.313	-06	15	33.31	9.8766460	9.6958864	16.83	1.2	5.9
05/27/2024	23	20	34.836	-06	14	28.90	9.8604084	9.6955945	16.85	1.2	5.9
05/28/2024	23	20	47.036	-06	13	26.62	9.8441142	9.6953025	16.88	1.2	5.9

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.
05/29/2024	23	20	58.911	-06	12	26.47	9.8277672	9.6950104	16.91	1.2	5.9
05/30/2024	23	21	10.456	-06	11	28.49	9.8113710	9.6947183	16.94	1.2	5.9
05/31/2024	23	21	21.669	-06	10	32.68	9.7949296	9.6944262	16.97	1.2	6.0
06/01/2024	23	21	32.548	-06	09	39.06	9.7784468	9.6941339	17.00	1.2	6.0
06/02/2024	23	21	43.091	-06	08	47.64	9.7619269	9.6938416	17.02	1.2	6.0
06/03/2024	23	21	53.298	-06	07	58.41	9.7453741	9.6935493	17.05	1.2	6.0
06/04/2024	23	22	03.169	-06	07	11.38	9.7287927	9.6932569	17.08	1.2	6.0
06/05/2024	23	22	12.700	-06	06	26.57	9.7121872	9.6929644	17.11	1.2	6.0
06/06/2024	23	22	21.891	-06	05	44.00	9.6955623	9.6926719	17.14	1.2	6.0
06/07/2024	23	22	30.736	-06	05	03.68	9.6789226	9.6923793	17.17	1.2	6.1
06/08/2024	23	22	39.233	-06	04	25.65	9.6622728	9.6920867	17.20	1.2	6.1
06/09/2024	23	22	47.377	-06	03	49.92	9.6456174	9.6917940	17.23	1.2	6.1
06/10/2024	23	22	55.167	-06	03	16.50	9.6289611	9.6915013	17.26	1.2	6.1
06/11/2024	23	23	02.599	-06	02	45.41	9.6123086	9.6912085	17.29	1.1	6.1
06/12/2024	23	23	09.673	-06	02	16.66	9.5956642	9.6909156	17.32	1.1	6.0
06/13/2024	23	23	16.387	-06	01	50.23	9.5790325	9.6906227	17.35	1.1	6.0
06/14/2024	23	23	22.741	-06	01	26.13	9.5624178	9.6903298	17.38	1.1	6.0
06/15/2024	23	23	28.735	-06	01	04.36	9.5458247	9.6900368	17.41	1.1	6.0
06/16/2024	23	23	34.369	-06	00	44.92	9.5292575	9.6897437	17.44	1.1	6.0
06/17/2024	23	23	39.644	-06	00	27.79	9.5127204	9.6894506	17.47	1.1	6.0
06/18/2024	23	23	44.558	-06	00	12.98	9.4962177	9.6891574	17.50	1.1	6.0
06/19/2024	23	23	49.113	-06	00	00.48	9.4797537	9.6888641	17.53	1.1	6.0
06/20/2024	23	23	53.307	-05	59	50.30	9.4633325	9.6885708	17.56	1.1	6.0
06/21/2024	23	23	57.140	-05	59	42.44	9.4469583	9.6882775	17.59	1.1	5.9
06/22/2024	23	24	00.611	-05	59	36.90	9.4306352	9.6879841	17.62	1.1	5.9
06/23/2024	23	24	03.717	-05	59	33.71	9.4143672	9.6876906	17.65	1.1	5.9
06/24/2024	23	24	06.455	-05	59	32.86	9.3981585	9.6873971	17.68	1.1	5.9
06/25/2024	23	24	08.823	-05	59	34.38	9.3820131	9.6871036	17.71	1.1	5.9
06/26/2024	23	24	10.820	-05	59	38.26	9.3659353	9.6868100	17.74	1.1	5.8
06/27/2024	23	24	12.444	-05	59	44.51	9.3499293	9.6865163	17.77	1.1	5.8
06/28/2024	23	24	13.695	-05	59	53.13	9.3339994	9.6862226	17.81	1.1	5.8
06/29/2024	23	24	14.576	-06	00	04.09	9.3181502	9.6859288	17.84	1.1	5.8
06/30/2024	23	24	15.086	-06	00	17.39	9.3023862	9.6856350	17.87	1.1	5.7
07/01/2024	23	24	15.228	-06	00	33.01	9.2867122	9.6853411	17.90	1.1	5.7
07/02/2024	23	24	15.002	-06	00	50.95	9.2711329	9.6850472	17.93	1.1	5.7
07/03/2024	23	24	14.409	-06	01	11.22	9.2556531	9.6847532	17.96	1.1	5.6
07/04/2024	23	24	13.448	-06	01	33.80	9.2402778	9.6844592	17.99	1.0	5.6
07/05/2024	23	24	12.117	-06	01	58.70	9.2250119	9.6841651	18.02	1.0	5.6
07/06/2024	23	24	10.416	-06	02	25.93	9.2098601	9.6838709	18.05	1.0	5.5
07/07/2024	23	24	08.345	-06	02	55.48	9.1948274	9.6835767	18.07	1.0	5.5
07/08/2024	23	24	05.904	-06	03	27.33	9.1799183	9.6832825	18.10	1.0	5.4
07/09/2024	23	24	03.094	-06	04	01.49	9.1651377	9.6829882	18.13	1.0	5.4
07/10/2024	23	23	59.917	-06	04	37.91	9.1504901	9.6826938	18.16	1.0	5.3
07/11/2024	23	23	56.375	-06	05	16.60	9.1359800	9.6823994	18.19	1.0	5.3
07/12/2024	23	23	52.471	-06	05	57.51	9.1216118	9.6821050	18.22	1.0	5.2
07/13/2024	23	23	48.209	-06	06	40.62	9.1073899	9.6818105	18.25	1.0	5.1
07/14/2024	23	23	43.592	-06	07	25.91	9.0933185	9.6815159	18.28	1.0	5.1
07/15/2024	23	23	38.622	-06	08	13.34	9.0794019	9.6812213	18.30	1.0	5.0
07/16/2024	23	23	33.304	-06	09	02.90	9.0656441	9.6809267	18.33	1.0	5.0
07/17/2024	23	23	27.640	-06	09	54.55	9.0520492	9.6806320	18.36	1.0	4.9

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.
07/18/2024	23 23 21.634	-06 10 48.28	9.0386211	9.6803372	18.39	1.0	4.8
07/19/2024	23 23 15.287	-06 11 44.07	9.0253638	9.6800424	18.41	1.0	4.8
07/20/2024	23 23 08.601	-06 12 41.90	9.0122811	9.6797475	18.44	1.0	4.7
07/21/2024	23 23 01.577	-06 13 41.76	8.9993766	9.6794526	18.47	0.9	4.7
07/22/2024	23 22 54.216	-06 14 43.64	8.9866542	9.6791576	18.49	0.9	4.6
07/23/2024	23 22 46.520	-06 15 47.52	8.9741175	9.6788626	18.52	0.9	4.5
07/24/2024	23 22 38.490	-06 16 53.38	8.9617704	9.6785676	18.54	0.9	4.5
07/25/2024	23 22 30.131	-06 18 01.18	8.9496166	9.6782724	18.57	0.9	4.4
07/26/2024	23 22 21.447	-06 19 10.89	8.9376601	9.6779773	18.59	0.9	4.3
07/27/2024	23 22 12.444	-06 20 22.48	8.9259049	9.6776821	18.62	0.9	4.3
07/28/2024	23 22 03.126	-06 21 35.89	8.9143551	9.6773868	18.64	0.9	4.2
07/29/2024	23 21 53.500	-06 22 51.10	8.9030148	9.6770915	18.67	0.9	4.1
07/30/2024	23 21 43.568	-06 24 08.08	8.8918881	9.6767961	18.69	0.9	4.0
07/31/2024	23 21 33.335	-06 25 26.80	8.8809791	9.6765007	18.71	0.9	3.9
08/01/2024	23 21 22.803	-06 26 47.24	8.8702919	9.6762052	18.74	0.9	3.9
08/02/2024	23 21 11.977	-06 28 09.37	8.8598305	9.6759097	18.76	0.9	3.8
08/03/2024	23 21 00.859	-06 29 33.16	8.8495989	9.6756141	18.78	0.9	3.7
08/04/2024	23 20 49.454	-06 30 58.58	8.8396007	9.6753185	18.80	0.9	3.6
08/05/2024	23 20 37.767	-06 32 25.58	8.8298398	9.6750228	18.82	0.8	3.5
08/06/2024	23 20 25.804	-06 33 54.11	8.8203196	9.6747271	18.84	0.8	3.4
08/07/2024	23 20 13.572	-06 35 24.14	8.8110435	9.6744314	18.86	0.8	3.3
08/08/2024	23 20 01.077	-06 36 55.60	8.8020150	9.6741355	18.88	0.8	3.2
08/09/2024	23 19 48.326	-06 38 28.44	8.7932370	9.6738397	18.90	0.8	3.2
08/10/2024	23 19 35.328	-06 40 02.62	8.7847126	9.6735438	18.92	0.8	3.1
08/11/2024	23 19 22.090	-06 41 38.06	8.7764448	9.6732478	18.94	0.8	3.0
08/12/2024	23 19 08.619	-06 43 14.73	8.7684363	9.6729518	18.95	0.8	2.9
08/13/2024	23 18 54.923	-06 44 52.56	8.7606898	9.6726557	18.97	0.8	2.8
08/14/2024	23 18 41.010	-06 46 31.52	8.7532077	9.6723596	18.99	0.8	2.7
08/15/2024	23 18 26.884	-06 48 11.55	8.7459925	9.6720635	19.00	0.8	2.6
08/16/2024	23 18 12.554	-06 49 52.61	8.7390465	9.6717672	19.02	0.8	2.5
08/17/2024	23 17 58.024	-06 51 34.66	8.7323717	9.6714710	19.03	0.8	2.4
08/18/2024	23 17 43.300	-06 53 17.67	8.7259703	9.6711747	19.05	0.8	2.3
08/19/2024	23 17 28.387	-06 55 01.59	8.7198443	9.6708783	19.06	0.7	2.2
08/20/2024	23 17 13.290	-06 56 46.38	8.7139955	9.6705819	19.07	0.7	2.1
08/21/2024	23 16 58.018	-06 58 31.99	8.7084261	9.6702855	19.08	0.7	2.0
08/22/2024	23 16 42.577	-07 00 18.36	8.7031379	9.6699890	19.10	0.7	1.9
08/23/2024	23 16 26.979	-07 02 05.41	8.6981330	9.6696924	19.11	0.7	1.8
08/24/2024	23 16 11.232	-07 03 53.10	8.6934136	9.6693958	19.12	0.7	1.7
08/25/2024	23 15 55.345	-07 05 41.36	8.6889818	9.6690992	19.13	0.7	1.6
08/26/2024	23 15 39.326	-07 07 30.14	8.6848395	9.6688025	19.14	0.7	1.5
08/27/2024	23 15 23.184	-07 09 19.40	8.6809890	9.6685057	19.14	0.7	1.4
08/28/2024	23 15 06.923	-07 11 09.09	8.6774320	9.6682090	19.15	0.7	1.3
08/29/2024	23 14 50.553	-07 12 59.16	8.6741703	9.6679121	19.16	0.7	1.2
08/30/2024	23 14 34.079	-07 14 49.57	8.6712057	9.6676152	19.17	0.7	1.1
08/31/2024	23 14 17.510	-07 16 40.26	8.6685396	9.6673183	19.17	0.7	1.0
09/01/2024	23 14 00.853	-07 18 31.17	8.6661734	9.6670213	19.18	0.7	0.9
09/02/2024	23 13 44.119	-07 20 22.24	8.6641082	9.6667243	19.18	0.7	0.7
09/03/2024	23 13 27.315	-07 22 13.41	8.6623451	9.6664272	19.19	0.6	0.6
09/04/2024	23 13 10.453	-07 24 04.60	8.6608849	9.6661301	19.19	0.6	0.5
09/05/2024	23 12 53.543	-07 25 55.76	8.6597281	9.6658329	19.19	0.6	0.4

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		
09/06/2024	23	12	36.595	-07	27	46.81	8.6588754	9.6655357	19.19	0.6	0.4
09/07/2024	23	12	19.620	-07	29	37.68	8.6583271	9.6652384	19.19	0.6	0.3
09/08/2024	23	12	02.627	-07	31	28.31	8.6580832	9.6649411	19.20	0.6	0.2
09/09/2024	23	11	45.627	-07	33	18.64	8.6581439	9.6646437	19.20	0.6	0.2
09/10/2024	23	11	28.629	-07	35	08.61	8.6585088	9.6643463	19.19	0.6	0.3
09/11/2024	23	11	11.643	-07	36	58.16	8.6591779	9.6640489	19.19	0.6	0.4
09/12/2024	23	10	54.676	-07	38	47.24	8.6601505	9.6637514	19.19	0.6	0.5
09/13/2024	23	10	37.738	-07	40	35.81	8.6614262	9.6634538	19.19	0.6	0.6
09/14/2024	23	10	20.835	-07	42	23.81	8.6630041	9.6631562	19.18	0.6	0.7
09/15/2024	23	10	03.974	-07	44	11.20	8.6648836	9.6628586	19.18	0.6	0.8
09/16/2024	23	09	47.163	-07	45	57.93	8.6670636	9.6625609	19.18	0.6	0.9
09/17/2024	23	09	30.410	-07	47	43.96	8.6695432	9.6622632	19.17	0.6	1.0
09/18/2024	23	09	13.724	-07	49	29.22	8.6723216	9.6619654	19.16	0.6	1.1
09/19/2024	23	08	57.114	-07	51	13.65	8.6753978	9.6616676	19.16	0.6	1.2
09/20/2024	23	08	40.592	-07	52	57.19	8.6787708	9.6613697	19.15	0.6	1.3
09/21/2024	23	08	24.169	-07	54	39.77	8.6824400	9.6610718	19.14	0.6	1.4
09/22/2024	23	08	07.853	-07	56	21.34	8.6864044	9.6607738	19.13	0.6	1.5
09/23/2024	23	07	51.653	-07	58	01.86	8.6906631	9.6604758	19.12	0.6	1.6
09/24/2024	23	07	35.576	-07	59	41.29	8.6952151	9.6601778	19.11	0.6	1.7
09/25/2024	23	07	19.628	-08	01	19.59	8.7000593	9.6598797	19.10	0.6	1.8
09/26/2024	23	07	03.818	-08	02	56.73	8.7051944	9.6595815	19.09	0.6	1.9
09/27/2024	23	06	48.152	-08	04	32.64	8.7106189	9.6592833	19.08	0.6	2.0
09/28/2024	23	06	32.639	-08	06	07.29	8.7163311	9.6589851	19.07	0.6	2.1
09/29/2024	23	06	17.287	-08	07	40.61	8.7223293	9.6586868	19.05	0.6	2.2
09/30/2024	23	06	02.106	-08	09	12.57	8.7286115	9.6583885	19.04	0.6	2.3
10/01/2024	23	05	47.103	-08	10	43.09	8.7351755	9.6580901	19.03	0.6	2.4
10/02/2024	23	05	32.290	-08	12	12.12	8.7420191	9.6577917	19.01	0.6	2.5
10/03/2024	23	05	17.674	-08	13	39.61	8.7491398	9.6574932	19.00	0.6	2.6
10/04/2024	23	05	03.267	-08	15	05.51	8.7565350	9.6571947	18.98	0.6	2.7
10/05/2024	23	04	49.075	-08	16	29.76	8.7642019	9.6568962	18.96	0.6	2.8
10/06/2024	23	04	35.109	-08	17	52.32	8.7721376	9.6565976	18.95	0.6	2.9
10/07/2024	23	04	21.375	-08	19	13.14	8.7803391	9.6562989	18.93	0.6	3.0
10/08/2024	23	04	07.882	-08	20	32.19	8.7888032	9.6560002	18.91	0.6	3.1
10/09/2024	23	03	54.636	-08	21	49.44	8.7975266	9.6557015	18.89	0.6	3.2
10/10/2024	23	03	41.644	-08	23	04.84	8.8065060	9.6554027	18.87	0.6	3.2
10/11/2024	23	03	28.910	-08	24	18.38	8.8157377	9.6551039	18.85	0.6	3.3
10/12/2024	23	03	16.439	-08	25	30.02	8.8252184	9.6548050	18.83	0.7	3.4
10/13/2024	23	03	04.238	-08	26	39.75	8.8349442	9.6545061	18.81	0.7	3.5
10/14/2024	23	02	52.310	-08	27	47.53	8.8449116	9.6542071	18.79	0.7	3.6
10/15/2024	23	02	40.661	-08	28	53.34	8.8551170	9.6539081	18.77	0.7	3.7
10/16/2024	23	02	29.299	-08	29	57.12	8.8655566	9.6536091	18.75	0.7	3.7
10/17/2024	23	02	18.231	-08	30	58.84	8.8762269	9.6533100	18.72	0.7	3.8
10/18/2024	23	02	07.464	-08	31	58.46	8.8871244	9.6530109	18.70	0.7	3.9
10/19/2024	23	01	57.005	-08	32	55.96	8.8982458	9.6527117	18.68	0.7	4.0
10/20/2024	23	01	46.861	-08	33	51.30	8.9095875	9.6524125	18.65	0.7	4.0
10/21/2024	23	01	37.034	-08	34	44.47	8.9211462	9.6521132	18.63	0.7	4.1
10/22/2024	23	01	27.528	-08	35	35.48	8.9329183	9.6518139	18.60	0.7	4.2
10/23/2024	23	01	18.347	-08	36	24.29	8.9449001	9.6515145	18.58	0.7	4.3
10/24/2024	23	01	09.493	-08	37	10.90	8.9570879	9.6512151	18.55	0.7	4.3
10/25/2024	23	01	00.971	-08	37	55.28	8.9694778	9.6509157	18.53	0.7	4.4

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		
10/26/2024	23	00	52.785	-08	38	37.40	8.9820658	9.6506162	18.50	0.7	4.5
10/27/2024	23	00	44.941	-08	39	17.25	8.9948475	9.6503167	18.48	0.7	4.6
10/28/2024	23	00	37.443	-08	39	54.79	9.0078189	9.6500171	18.45	0.7	4.6
10/29/2024	23	00	30.298	-08	40	29.99	9.0209755	9.6497175	18.42	0.7	4.7
10/30/2024	23	00	23.509	-08	41	02.82	9.0343127	9.6494178	18.40	0.7	4.8
10/31/2024	23	00	17.082	-08	41	33.27	9.0478260	9.6491181	18.37	0.7	4.8
11/01/2024	23	00	11.021	-08	42	01.31	9.0615106	9.6488183	18.34	0.8	4.9
11/02/2024	23	00	05.332	-08	42	26.92	9.0753619	9.6485185	18.31	0.8	4.9
11/03/2024	23	00	00.017	-08	42	50.08	9.0893748	9.6482187	18.28	0.8	5.0
11/04/2024	22	59	55.080	-08	43	10.80	9.1035444	9.6479188	18.26	0.8	5.1
11/05/2024	22	59	50.523	-08	43	29.05	9.1178658	9.6476189	18.23	0.8	5.1
11/06/2024	22	59	46.348	-08	43	44.84	9.1323338	9.6473189	18.20	0.8	5.2
11/07/2024	22	59	42.555	-08	43	58.18	9.1469434	9.6470189	18.17	0.8	5.2
11/08/2024	22	59	39.145	-08	44	09.05	9.1616894	9.6467189	18.14	0.8	5.2
11/09/2024	22	59	36.119	-08	44	17.47	9.1765666	9.6464188	18.11	0.8	5.3
11/10/2024	22	59	33.477	-08	44	23.43	9.1915700	9.6461186	18.08	0.8	5.3
11/11/2024	22	59	31.220	-08	44	26.93	9.2066946	9.6458184	18.05	0.8	5.4
11/12/2024	22	59	29.350	-08	44	27.96	9.2219352	9.6455182	18.02	0.8	5.4
11/13/2024	22	59	27.870	-08	44	26.51	9.2372870	9.6452179	17.99	0.8	5.4
11/14/2024	22	59	26.781	-08	44	22.57	9.2527452	9.6449176	17.96	0.8	5.5
11/15/2024	22	59	26.088	-08	44	16.13	9.2683052	9.6446173	17.93	0.8	5.5
11/16/2024	22	59	25.791	-08	44	07.19	9.2839623	9.6443169	17.90	0.8	5.5
11/17/2024	22	59	25.890	-08	43	55.76	9.2997119	9.6440164	17.87	0.8	5.6
11/18/2024	22	59	26.385	-08	43	41.87	9.3155497	9.6437160	17.84	0.8	5.6
11/19/2024	22	59	27.274	-08	43	25.51	9.3314710	9.6434154	17.81	0.8	5.6
11/20/2024	22	59	28.555	-08	43	06.72	9.3474712	9.6431149	17.78	0.8	5.6
11/21/2024	22	59	30.227	-08	42	45.48	9.3635455	9.6428143	17.75	0.9	5.7
11/22/2024	22	59	32.290	-08	42	21.82	9.3796893	9.6425136	17.72	0.9	5.7
11/23/2024	22	59	34.745	-08	41	55.71	9.3958976	9.6422129	17.69	0.9	5.7
11/24/2024	22	59	37.592	-08	41	27.17	9.4121655	9.6419122	17.66	0.9	5.7
11/25/2024	22	59	40.832	-08	40	56.18	9.4284880	9.6416114	17.63	0.9	5.8
11/26/2024	22	59	44.467	-08	40	22.74	9.4448600	9.6413106	17.60	0.9	5.8
11/27/2024	22	59	48.495	-08	39	46.86	9.4612763	9.6410097	17.57	0.9	5.8
11/28/2024	22	59	52.919	-08	39	08.53	9.4777320	9.6407088	17.54	0.9	5.8
11/29/2024	22	59	57.738	-08	38	27.76	9.4942217	9.6404079	17.50	0.9	5.8
11/30/2024	23	00	02.952	-08	37	44.55	9.5107403	9.6401069	17.47	0.9	5.8
12/01/2024	23	00	08.560	-08	36	58.92	9.5272825	9.6398059	17.44	0.9	5.8
12/02/2024	23	00	14.561	-08	36	10.87	9.5438431	9.6395048	17.41	0.9	5.8
12/03/2024	23	00	20.952	-08	35	20.44	9.5604167	9.6392037	17.38	0.9	5.8
12/04/2024	23	00	27.729	-08	34	27.64	9.5769981	9.6389026	17.35	0.9	5.8
12/05/2024	23	00	34.891	-08	33	32.50	9.5935820	9.6386014	17.32	0.9	5.8
12/06/2024	23	00	42.433	-08	32	35.03	9.6101634	9.6383002	17.29	0.9	5.8
12/07/2024	23	00	50.353	-08	31	35.26	9.6267370	9.6379989	17.26	0.9	5.8
12/08/2024	23	00	58.647	-08	30	33.20	9.6432978	9.6376976	17.23	0.9	5.8
12/09/2024	23	01	07.313	-08	29	28.87	9.6598409	9.6373963	17.20	0.9	5.8
12/10/2024	23	01	16.351	-08	28	22.27	9.6763615	9.6370949	17.18	0.9	5.8
12/11/2024	23	01	25.759	-08	27	13.40	9.6928550	9.6367935	17.15	0.9	5.8
12/12/2024	23	01	35.537	-08	26	02.29	9.7093167	9.6364920	17.12	0.9	5.8
12/13/2024	23	01	45.683	-08	24	48.94	9.7257424	9.6361905	17.09	1.0	5.8
12/14/2024	23	01	56.194	-08	23	33.38	9.7421278	9.6358889	17.06	1.0	5.7

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.
12/15/2024	23 02 07.067	-08 22 15.63	9.7584685	9.6355874	17.03	1.0	5.7
12/16/2024	23 02 18.297	-08 20 55.74	9.7747606	9.6352857	17.00	1.0	5.7
12/17/2024	23 02 29.879	-08 19 33.72	9.7909997	9.6349841	16.97	1.0	5.7
12/18/2024	23 02 41.810	-08 18 09.62	9.8071819	9.6346824	16.95	1.0	5.7
12/19/2024	23 02 54.084	-08 16 43.43	9.8233027	9.6343807	16.92	1.0	5.6
12/20/2024	23 03 06.700	-08 15 15.19	9.8393579	9.6340789	16.89	1.0	5.6
12/21/2024	23 03 19.655	-08 13 44.90	9.8553433	9.6337771	16.86	1.0	5.6
12/22/2024	23 03 32.947	-08 12 12.57	9.8712544	9.6334752	16.84	1.0	5.6
12/23/2024	23 03 46.575	-08 10 38.21	9.8870869	9.6331734	16.81	1.0	5.5
12/24/2024	23 04 00.536	-08 09 01.84	9.9028364	9.6328714	16.78	1.0	5.5
12/25/2024	23 04 14.829	-08 07 23.46	9.9184985	9.6325695	16.76	1.0	5.5
12/26/2024	23 04 29.452	-08 05 43.09	9.9340687	9.6322675	16.73	1.0	5.5
12/27/2024	23 04 44.401	-08 04 00.76	9.9495428	9.6319654	16.70	1.0	5.4
12/28/2024	23 04 59.675	-08 02 16.47	9.9649162	9.6316634	16.68	1.0	5.4
12/29/2024	23 05 15.268	-08 00 30.26	9.9801847	9.6313613	16.65	1.0	5.4
12/30/2024	23 05 31.177	-07 58 42.16	9.9953438	9.6310591	16.63	1.0	5.3
12/31/2024	23 05 47.397	-07 56 52.19	10.0103892	9.6307569	16.60	1.0	5.3
01/01/2025	23 06 03.923	-07 55 00.40	10.0253165	9.6304547	16.58	1.0	5.2



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.
12/31/2023	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
01/03/2024	03 07 54.448	17 16 06.97	19.0022443	19.6131298	3.71	5.7	2.3
01/04/2024	03 07 49.579	17 15 48.66	19.0159454	19.6129701	3.71	5.7	2.3
01/05/2024	03 07 44.897	17 15 31.10	19.0298298	19.6128103	3.70	5.7	2.4
01/06/2024	03 07 40.405	17 15 14.30	19.0438933	19.6126504	3.70	5.7	2.4
01/07/2024	03 07 36.107	17 14 58.28	19.0581311	19.6124906	3.70	5.7	2.4
01/08/2024	03 07 32.005	17 14 43.05	19.0725386	19.6123307	3.70	5.7	2.4
01/09/2024	03 07 28.101	17 14 28.64	19.0871110	19.6121708	3.69	5.7	2.5
01/10/2024	03 07 24.396	17 14 15.05	19.1018433	19.6120109	3.69	5.7	2.5
01/11/2024	03 07 20.890	17 14 02.29	19.1167304	19.6118509	3.69	5.7	2.5
01/12/2024	03 07 17.582	17 13 50.37	19.1317671	19.6116910	3.68	5.7	2.6
01/13/2024	03 07 14.472	17 13 39.27	19.1469479	19.6115310	3.68	5.7	2.6
01/14/2024	03 07 11.559	17 13 28.97	19.1622675	19.6113709	3.68	5.7	2.6
01/15/2024	03 07 08.847	17 13 19.49	19.1777202	19.6112109	3.68	5.7	2.6
01/16/2024	03 07 06.338	17 13 10.81	19.1933005	19.6110508	3.67	5.7	2.6
01/17/2024	03 07 04.035	17 13 02.95	19.2090029	19.6108907	3.67	5.7	2.7
01/18/2024	03 07 01.941	17 12 55.92	19.2248220	19.6107306	3.67	5.7	2.7
01/19/2024	03 07 00.059	17 12 49.73	19.2407524	19.6105704	3.66	5.7	2.7
01/20/2024	03 06 58.389	17 12 44.41	19.2567888	19.6104102	3.66	5.7	2.7
01/21/2024	03 06 56.931	17 12 39.95	19.2729261	19.6102500	3.66	5.7	2.7
01/22/2024	03 06 55.686	17 12 36.37	19.2891591	19.6100898	3.65	5.7	2.8
01/23/2024	03 06 54.651	17 12 33.67	19.3054828	19.6099295	3.65	5.7	2.8
01/24/2024	03 06 53.826	17 12 31.83	19.3218920	19.6097692	3.65	5.7	2.8
01/25/2024	03 06 53.210	17 12 30.86	19.3383818	19.6096089	3.64	5.7	2.8
01/26/2024	03 06 52.803	17 12 30.75	19.3549473	19.6094486	3.64	5.7	2.8
01/27/2024	03 06 52.604	17 12 31.48	19.3715833	19.6092882	3.64	5.7	2.8
01/28/2024	03 06 52.614	17 12 33.06	19.3882850	19.6091279	3.64	5.7	2.8
01/29/2024	03 06 52.834	17 12 35.49	19.4050474	19.6089675	3.63	5.7	2.8
01/30/2024	03 06 53.265	17 12 38.76	19.4218654	19.6088070	3.63	5.7	2.8
01/31/2024	03 06 53.908	17 12 42.88	19.4387339	19.6086466	3.63	5.7	2.9
02/01/2024	03 06 54.765	17 12 47.85	19.4556480	19.6084861	3.62	5.7	2.9
02/02/2024	03 06 55.836	17 12 53.68	19.4726025	19.6083256	3.62	5.7	2.9
02/03/2024	03 06 57.123	17 13 00.37	19.4895922	19.6081650	3.62	5.7	2.9
02/04/2024	03 06 58.626	17 13 07.94	19.5066119	19.6080045	3.61	5.7	2.9
02/05/2024	03 07 00.346	17 13 16.39	19.5236565	19.6078439	3.61	5.7	2.9
02/06/2024	03 07 02.281	17 13 25.73	19.5407206	19.6076833	3.61	5.7	2.9
02/07/2024	03 07 04.430	17 13 35.96	19.5577988	19.6075226	3.60	5.7	2.9
02/08/2024	03 07 06.792	17 13 47.06	19.5748856	19.6073620	3.60	5.7	2.9
02/09/2024	03 07 09.362	17 13 59.03	19.5919754	19.6072013	3.60	5.7	2.9
02/10/2024	03 07 12.139	17 14 11.85	19.6090627	19.6070406	3.59	5.7	2.9
02/11/2024	03 07 15.122	17 14 25.49	19.6261418	19.6068799	3.59	5.7	2.9
02/12/2024	03 07 18.312	17 14 39.95	19.6432069	19.6067191	3.59	5.7	2.9
02/13/2024	03 07 21.710	17 14 55.21	19.6602526	19.6065583	3.58	5.7	2.9
02/14/2024	03 07 25.317	17 15 11.30	19.6772733	19.6063975	3.58	5.7	2.9
02/15/2024	03 07 29.135	17 15 28.20	19.6942637	19.6062367	3.58	5.7	2.9
02/16/2024	03 07 33.162	17 15 45.94	19.7112186	19.6060758	3.58	5.8	2.9
02/17/2024	03 07 37.398	17 16 04.51	19.7281331	19.6059149	3.57	5.8	2.9
02/18/2024	03 07 41.839	17 16 23.92	19.7450021	19.6057540	3.57	5.8	2.9

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.
02/19/2024	03 07 46.483	17 16 44.14	19.7618210	19.6055931	3.57	5.8	2.8
02/20/2024	03 07 51.327	17 17 05.18	19.7785849	19.6054321	3.56	5.8	2.8
02/21/2024	03 07 56.369	17 17 27.01	19.7952892	19.6052711	3.56	5.8	2.8
02/22/2024	03 08 01.605	17 17 49.62	19.8119294	19.6051101	3.56	5.8	2.8
02/23/2024	03 08 07.035	17 18 13.00	19.8285010	19.6049491	3.55	5.8	2.8
02/24/2024	03 08 12.657	17 18 37.14	19.8449994	19.6047880	3.55	5.8	2.8
02/25/2024	03 08 18.471	17 19 02.02	19.8614202	19.6046269	3.55	5.8	2.8
02/26/2024	03 08 24.474	17 19 27.64	19.8777590	19.6044658	3.55	5.8	2.8
02/27/2024	03 08 30.668	17 19 53.98	19.8940115	19.6043047	3.54	5.8	2.8
02/28/2024	03 08 37.052	17 20 21.06	19.9101732	19.6041435	3.54	5.8	2.7
02/29/2024	03 08 43.625	17 20 48.86	19.9262398	19.6039823	3.54	5.8	2.7
03/01/2024	03 08 50.388	17 21 17.38	19.9422068	19.6038211	3.53	5.8	2.7
03/02/2024	03 08 57.339	17 21 46.64	19.9580700	19.6036599	3.53	5.8	2.7
03/03/2024	03 09 04.476	17 22 16.62	19.9738249	19.6034986	3.53	5.8	2.7
03/04/2024	03 09 11.798	17 22 47.32	19.9894671	19.6033373	3.53	5.8	2.7
03/05/2024	03 09 19.303	17 23 18.75	20.0049922	19.6031760	3.52	5.8	2.6
03/06/2024	03 09 26.987	17 23 50.88	20.0203957	19.6030146	3.52	5.8	2.6
03/07/2024	03 09 34.846	17 24 23.71	20.0356732	19.6028533	3.52	5.8	2.6
03/08/2024	03 09 42.877	17 24 57.22	20.0508200	19.6026919	3.52	5.8	2.6
03/09/2024	03 09 51.077	17 25 31.37	20.0658317	19.6025304	3.51	5.8	2.6
03/10/2024	03 09 59.443	17 26 06.14	20.0807036	19.6023690	3.51	5.8	2.5
03/11/2024	03 10 07.977	17 26 41.52	20.0954313	19.6022075	3.51	5.8	2.5
03/12/2024	03 10 16.678	17 27 17.51	20.1100103	19.6020460	3.50	5.8	2.5
03/13/2024	03 10 25.547	17 27 54.10	20.1244365	19.6018845	3.50	5.8	2.5
03/14/2024	03 10 34.583	17 28 31.30	20.1387058	19.6017230	3.50	5.8	2.4
03/15/2024	03 10 43.783	17 29 09.11	20.1528144	19.6015614	3.50	5.8	2.4
03/16/2024	03 10 53.144	17 29 47.53	20.1667586	19.6013998	3.49	5.8	2.4
03/17/2024	03 11 02.661	17 30 26.55	20.1805348	19.6012381	3.49	5.8	2.3
03/18/2024	03 11 12.331	17 31 06.14	20.1941398	19.6010765	3.49	5.8	2.3
03/19/2024	03 11 22.150	17 31 46.29	20.2075701	19.6009148	3.49	5.8	2.3
03/20/2024	03 11 32.114	17 32 26.99	20.2208226	19.6007531	3.49	5.8	2.2
03/21/2024	03 11 42.220	17 33 08.20	20.2338942	19.6005914	3.48	5.8	2.2
03/22/2024	03 11 52.467	17 33 49.92	20.2467818	19.6004296	3.48	5.8	2.2
03/23/2024	03 12 02.853	17 34 32.13	20.2594824	19.6002678	3.48	5.8	2.2
03/24/2024	03 12 13.375	17 35 14.81	20.2719930	19.6001060	3.48	5.8	2.1
03/25/2024	03 12 24.032	17 35 57.96	20.2843108	19.5999442	3.47	5.8	2.1
03/26/2024	03 12 34.824	17 36 41.57	20.2964328	19.5997823	3.47	5.8	2.1
03/27/2024	03 12 45.749	17 37 25.64	20.3083562	19.5996204	3.47	5.8	2.0
03/28/2024	03 12 56.807	17 38 10.16	20.3200783	19.5994585	3.47	5.8	2.0
03/29/2024	03 13 07.994	17 38 55.12	20.3315962	19.5992966	3.47	5.8	2.0
03/30/2024	03 13 19.310	17 39 40.53	20.3429070	19.5991346	3.46	5.8	1.9
03/31/2024	03 13 30.751	17 40 26.39	20.3540080	19.5989726	3.46	5.8	1.9
04/01/2024	03 13 42.315	17 41 12.68	20.3648965	19.5988106	3.46	5.8	1.9
04/02/2024	03 13 53.997	17 41 59.39	20.3755695	19.5986485	3.46	5.8	1.8
04/03/2024	03 14 05.795	17 42 46.51	20.3860242	19.5984865	3.46	5.8	1.8
04/04/2024	03 14 17.703	17 43 34.02	20.3962578	19.5983244	3.46	5.8	1.7
04/05/2024	03 14 29.718	17 44 21.88	20.4062675	19.5981622	3.45	5.8	1.7
04/06/2024	03 14 41.837	17 45 10.08	20.4160503	19.5980001	3.45	5.8	1.7
04/07/2024	03 14 54.058	17 45 58.60	20.4256035	19.5978379	3.45	5.8	1.6
04/08/2024	03 15 06.382	17 46 47.42	20.4349244	19.5976757	3.45	5.8	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.
04/09/2024	03 15 18.807	17 47 36.54	20.4440103	19.5975135	3.45	5.8	1.5
04/10/2024	03 15 31.334	17 48 25.96	20.4528589	19.5973512	3.45	5.8	1.5
04/11/2024	03 15 43.960	17 49 15.69	20.4614679	19.5971890	3.44	5.8	1.5
04/12/2024	03 15 56.682	17 50 05.72	20.4698354	19.5970267	3.44	5.8	1.4
04/13/2024	03 16 09.495	17 50 56.04	20.4779594	19.5968643	3.44	5.8	1.4
04/14/2024	03 16 22.393	17 51 46.64	20.4858384	19.5967020	3.44	5.8	1.3
04/15/2024	03 16 35.373	17 52 37.50	20.4934706	19.5965396	3.44	5.8	1.3
04/16/2024	03 16 48.431	17 53 28.59	20.5008548	19.5963772	3.44	5.8	1.2
04/17/2024	03 17 01.562	17 54 19.89	20.5079896	19.5962147	3.44	5.8	1.2
04/18/2024	03 17 14.765	17 55 11.40	20.5148735	19.5960523	3.44	5.8	1.2
04/19/2024	03 17 28.037	17 56 03.08	20.5215055	19.5958898	3.43	5.8	1.1
04/20/2024	03 17 41.375	17 56 54.93	20.5278842	19.5957273	3.43	5.8	1.1
04/21/2024	03 17 54.779	17 57 46.93	20.5340087	19.5955648	3.43	5.8	1.0
04/22/2024	03 18 08.247	17 58 39.09	20.5398777	19.5954022	3.43	5.8	1.0
04/23/2024	03 18 21.777	17 59 31.38	20.5454903	19.5952396	3.43	5.8	0.9
04/24/2024	03 18 35.368	18 00 23.82	20.5508454	19.5950770	3.43	5.8	0.9
04/25/2024	03 18 49.018	18 01 16.39	20.5559419	19.5949143	3.43	5.8	0.9
04/26/2024	03 19 02.725	18 02 09.09	20.5607790	19.5947517	3.43	5.8	0.8
04/27/2024	03 19 16.487	18 03 01.92	20.5653556	19.5945890	3.43	5.8	0.8
04/28/2024	03 19 30.298	18 03 54.88	20.5696707	19.5944262	3.43	5.8	0.7
04/29/2024	03 19 44.157	18 04 47.95	20.5737233	19.5942635	3.43	5.8	0.7
04/30/2024	03 19 58.059	18 05 41.11	20.5775123	19.5941007	3.43	5.8	0.6
05/01/2024	03 20 11.999	18 06 34.36	20.5810367	19.5939379	3.42	5.8	0.6
05/02/2024	03 20 25.973	18 07 27.66	20.5842955	19.5937751	3.42	5.8	0.5
05/03/2024	03 20 39.979	18 08 21.00	20.5872877	19.5936122	3.42	5.8	0.5
05/04/2024	03 20 54.014	18 09 14.35	20.5900122	19.5934494	3.42	5.8	0.5
05/05/2024	03 21 08.078	18 10 07.69	20.5924681	19.5932865	3.42	5.8	0.4
05/06/2024	03 21 22.169	18 11 01.03	20.5946546	19.5931235	3.42	5.8	0.4
05/07/2024	03 21 36.287	18 11 54.35	20.5965710	19.5929606	3.42	5.8	0.3
05/08/2024	03 21 50.431	18 12 47.68	20.5982168	19.5927976	3.42	5.8	0.3
05/09/2024	03 22 04.598	18 13 41.00	20.5995916	19.5926346	3.42	5.8	0.2
05/10/2024	03 22 18.782	18 14 34.31	20.6006953	19.5924715	3.42	5.8	0.2
05/11/2024	03 22 32.981	18 15 27.60	20.6015280	19.5923085	3.42	5.8	0.1
05/12/2024	03 22 47.187	18 16 20.85	20.6020898	19.5921454	3.42	5.8	0.1
05/13/2024	03 23 01.397	18 17 14.05	20.6023810	19.5919822	3.42	5.8	0.0
05/14/2024	03 23 15.607	18 18 07.16	20.6024019	19.5918191	3.42	5.8	0.0
05/15/2024	03 23 29.814	18 19 00.18	20.6021532	19.5916559	3.42	5.8	0.1
05/16/2024	03 23 44.016	18 19 53.09	20.6016352	19.5914927	3.42	5.8	0.1
05/17/2024	03 23 58.210	18 20 45.88	20.6008485	19.5913295	3.42	5.8	0.2
05/18/2024	03 24 12.394	18 21 38.52	20.5997937	19.5911663	3.42	5.8	0.2
05/19/2024	03 24 26.568	18 22 31.02	20.5984716	19.5910030	3.42	5.8	0.3
05/20/2024	03 24 40.729	18 23 23.38	20.5968827	19.5908397	3.42	5.8	0.3
05/21/2024	03 24 54.877	18 24 15.58	20.5950278	19.5906763	3.42	5.8	0.3
05/22/2024	03 25 09.009	18 25 07.63	20.5929076	19.5905130	3.42	5.8	0.4
05/23/2024	03 25 23.123	18 25 59.53	20.5905229	19.5903496	3.42	5.8	0.4
05/24/2024	03 25 37.218	18 26 51.27	20.5878744	19.5901862	3.42	5.8	0.5
05/25/2024	03 25 51.290	18 27 42.86	20.5849627	19.5900227	3.42	5.8	0.5
05/26/2024	03 26 05.334	18 28 34.28	20.5817887	19.5898593	3.42	5.8	0.6
05/27/2024	03 26 19.348	18 29 25.52	20.5783530	19.5896958	3.43	5.8	0.6
05/28/2024	03 26 33.326	18 30 16.57	20.5746562	19.5895323	3.43	5.8	0.7

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.
05/29/2024	03 26 47.264	18 31 07.41	20.5706990	19.5893687	3.43	5.8	0.7
05/30/2024	03 27 01.160	18 31 58.01	20.5664821	19.5892052	3.43	5.8	0.8
05/31/2024	03 27 15.011	18 32 48.35	20.5620061	19.5890416	3.43	5.8	0.8
06/01/2024	03 27 28.816	18 33 38.43	20.5572718	19.5888779	3.43	5.8	0.8
06/02/2024	03 27 42.574	18 34 28.23	20.5522799	19.5887143	3.43	5.8	0.9
06/03/2024	03 27 56.285	18 35 17.76	20.5470315	19.5885506	3.43	5.8	0.9
06/04/2024	03 28 09.948	18 36 07.01	20.5415277	19.5883869	3.43	5.8	1.0
06/05/2024	03 28 23.560	18 36 55.99	20.5357696	19.5882232	3.43	5.8	1.0
06/06/2024	03 28 37.117	18 37 44.71	20.5297588	19.5880594	3.43	5.8	1.1
06/07/2024	03 28 50.616	18 38 33.15	20.5234967	19.5878956	3.43	5.8	1.1
06/08/2024	03 29 04.051	18 39 21.31	20.5169851	19.5877318	3.44	5.8	1.2
06/09/2024	03 29 17.417	18 40 09.16	20.5102260	19.5875680	3.44	5.8	1.2
06/10/2024	03 29 30.711	18 40 56.68	20.5032213	19.5874041	3.44	5.8	1.3
06/11/2024	03 29 43.929	18 41 43.87	20.4959730	19.5872402	3.44	5.8	1.3
06/12/2024	03 29 57.069	18 42 30.70	20.4884832	19.5870763	3.44	5.8	1.3
06/13/2024	03 30 10.128	18 43 17.16	20.4807542	19.5869123	3.44	5.8	1.4
06/14/2024	03 30 23.105	18 44 03.24	20.4727881	19.5867484	3.44	5.8	1.4
06/15/2024	03 30 35.999	18 44 48.94	20.4645871	19.5865844	3.44	5.8	1.5
06/16/2024	03 30 48.808	18 45 34.25	20.4561536	19.5864203	3.45	5.8	1.5
06/17/2024	03 31 01.532	18 46 19.17	20.4474897	19.5862563	3.45	5.8	1.5
06/18/2024	03 31 14.168	18 47 03.71	20.4385978	19.5860922	3.45	5.8	1.6
06/19/2024	03 31 26.715	18 47 47.85	20.4294803	19.5859281	3.45	5.8	1.6
06/20/2024	03 31 39.172	18 48 31.61	20.4201394	19.5857640	3.45	5.8	1.7
06/21/2024	03 31 51.534	18 49 14.98	20.4105773	19.5855998	3.45	5.8	1.7
06/22/2024	03 32 03.800	18 49 57.97	20.4007964	19.5854356	3.45	5.8	1.7
06/23/2024	03 32 15.964	18 50 40.56	20.3907990	19.5852714	3.46	5.8	1.8
06/24/2024	03 32 28.024	18 51 22.74	20.3805870	19.5851072	3.46	5.8	1.8
06/25/2024	03 32 39.974	18 52 04.49	20.3701629	19.5849429	3.46	5.8	1.8
06/26/2024	03 32 51.812	18 52 45.79	20.3595286	19.5847786	3.46	5.8	1.9
06/27/2024	03 33 03.535	18 53 26.62	20.3486863	19.5846143	3.46	5.8	1.9
06/28/2024	03 33 15.143	18 54 06.98	20.3376383	19.5844499	3.47	5.8	1.9
06/29/2024	03 33 26.634	18 54 46.84	20.3263869	19.5842856	3.47	5.8	2.0
06/30/2024	03 33 38.010	18 55 26.23	20.3149343	19.5841212	3.47	5.8	2.0
07/01/2024	03 33 49.269	18 56 05.13	20.3032833	19.5839568	3.47	5.8	2.1
07/02/2024	03 34 00.409	18 56 43.55	20.2914363	19.5837923	3.47	5.8	2.1
07/03/2024	03 34 11.427	18 57 21.51	20.2793963	19.5836278	3.48	5.8	2.1
07/04/2024	03 34 22.320	18 57 58.99	20.2671663	19.5834634	3.48	5.8	2.2
07/05/2024	03 34 33.084	18 58 35.99	20.2547493	19.5832988	3.48	5.8	2.2
07/06/2024	03 34 43.713	18 59 12.50	20.2421486	19.5831343	3.48	5.8	2.2
07/07/2024	03 34 54.204	18 59 48.50	20.2293676	19.5829697	3.48	5.8	2.3
07/08/2024	03 35 04.553	19 00 23.97	20.2164097	19.5828051	3.49	5.8	2.3
07/09/2024	03 35 14.759	19 00 58.90	20.2032784	19.5826405	3.49	5.8	2.3
07/10/2024	03 35 24.819	19 01 33.28	20.1899773	19.5824758	3.49	5.8	2.3
07/11/2024	03 35 34.732	19 02 07.10	20.1765100	19.5823112	3.49	5.8	2.4
07/12/2024	03 35 44.498	19 02 40.35	20.1628801	19.5821465	3.50	5.8	2.4
07/13/2024	03 35 54.115	19 03 13.04	20.1490911	19.5819817	3.50	5.8	2.4
07/14/2024	03 36 03.582	19 03 45.16	20.1351469	19.5818170	3.50	5.8	2.5
07/15/2024	03 36 12.899	19 04 16.71	20.1210509	19.5816522	3.50	5.8	2.5
07/16/2024	03 36 22.064	19 04 47.70	20.1068070	19.5814874	3.51	5.8	2.5
07/17/2024	03 36 31.076	19 05 18.13	20.0924186	19.5813226	3.51	5.8	2.5

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.
07/18/2024	03 36 39.934	19 05 48.01	20.0778896	19.5811578	3.51	5.8	2.6
07/19/2024	03 36 48.635	19 06 17.34	20.0632234	19.5809929	3.51	5.8	2.6
07/20/2024	03 36 57.175	19 06 46.11	20.0484236	19.5808280	3.52	5.8	2.6
07/21/2024	03 37 05.550	19 07 14.31	20.0334939	19.5806631	3.52	5.8	2.6
07/22/2024	03 37 13.758	19 07 41.94	20.0184375	19.5804981	3.52	5.8	2.6
07/23/2024	03 37 21.796	19 08 08.97	20.0032580	19.5803331	3.52	5.8	2.7
07/24/2024	03 37 29.660	19 08 35.38	19.9879587	19.5801681	3.53	5.8	2.7
07/25/2024	03 37 37.351	19 09 01.15	19.9725431	19.5800031	3.53	5.8	2.7
07/26/2024	03 37 44.868	19 09 26.30	19.9570146	19.5798381	3.53	5.8	2.7
07/27/2024	03 37 52.214	19 09 50.80	19.9413768	19.5796730	3.53	5.8	2.7
07/28/2024	03 37 59.386	19 10 14.69	19.9256335	19.5795079	3.54	5.8	2.8
07/29/2024	03 38 06.385	19 10 37.95	19.9097884	19.5793428	3.54	5.8	2.8
07/30/2024	03 38 13.209	19 11 00.61	19.8938455	19.5791776	3.54	5.8	2.8
07/31/2024	03 38 19.854	19 11 22.65	19.8778090	19.5790125	3.55	5.8	2.8
08/01/2024	03 38 26.317	19 11 44.08	19.8616831	19.5788473	3.55	5.8	2.8
08/02/2024	03 38 32.595	19 12 04.89	19.8454722	19.5786821	3.55	5.8	2.8
08/03/2024	03 38 38.684	19 12 25.06	19.8291807	19.5785168	3.55	5.8	2.9
08/04/2024	03 38 44.582	19 12 44.59	19.8128132	19.5783515	3.56	5.8	2.9
08/05/2024	03 38 50.287	19 13 03.45	19.7963743	19.5781863	3.56	5.8	2.9
08/06/2024	03 38 55.797	19 13 21.65	19.7798686	19.5780209	3.56	5.8	2.9
08/07/2024	03 39 01.112	19 13 39.17	19.7633007	19.5778556	3.57	5.8	2.9
08/08/2024	03 39 06.232	19 13 56.01	19.7466754	19.5776902	3.57	5.8	2.9
08/09/2024	03 39 11.157	19 14 12.17	19.7299973	19.5775248	3.57	5.7	2.9
08/10/2024	03 39 15.886	19 14 27.65	19.7132711	19.5773594	3.58	5.7	2.9
08/11/2024	03 39 20.421	19 14 42.45	19.6965015	19.5771940	3.58	5.7	2.9
08/12/2024	03 39 24.760	19 14 56.59	19.6796932	19.5770285	3.58	5.7	2.9
08/13/2024	03 39 28.904	19 15 10.06	19.6628507	19.5768631	3.58	5.7	2.9
08/14/2024	03 39 32.852	19 15 22.88	19.6459788	19.5766975	3.59	5.7	2.9
08/15/2024	03 39 36.602	19 15 35.04	19.6290819	19.5765320	3.59	5.7	2.9
08/16/2024	03 39 40.152	19 15 46.56	19.6121646	19.5763665	3.59	5.7	2.9
08/17/2024	03 39 43.502	19 15 57.42	19.5952314	19.5762009	3.60	5.7	2.9
08/18/2024	03 39 46.647	19 16 07.63	19.5782866	19.5760353	3.60	5.7	2.9
08/19/2024	03 39 49.585	19 16 17.16	19.5613346	19.5758696	3.60	5.7	2.9
08/20/2024	03 39 52.316	19 16 25.99	19.5443795	19.5757040	3.61	5.7	2.9
08/21/2024	03 39 54.838	19 16 34.13	19.5274258	19.5755383	3.61	5.7	2.9
08/22/2024	03 39 57.154	19 16 41.54	19.5104774	19.5753726	3.61	5.7	2.9
08/23/2024	03 39 59.265	19 16 48.25	19.4935389	19.5752069	3.62	5.7	2.9
08/24/2024	03 40 01.173	19 16 54.26	19.4766144	19.5750411	3.62	5.7	2.9
08/25/2024	03 40 02.879	19 16 59.58	19.4597086	19.5748754	3.62	5.7	2.9
08/26/2024	03 40 04.382	19 17 04.23	19.4428262	19.5747096	3.63	5.7	2.9
08/27/2024	03 40 05.680	19 17 08.20	19.4259718	19.5745437	3.63	5.7	2.9
08/28/2024	03 40 06.771	19 17 11.52	19.4091503	19.5743779	3.63	5.7	2.9
08/29/2024	03 40 07.654	19 17 14.15	19.3923668	19.5742120	3.63	5.7	2.9
08/30/2024	03 40 08.325	19 17 16.11	19.3756263	19.5740461	3.64	5.7	2.9
08/31/2024	03 40 08.784	19 17 17.38	19.3589338	19.5738802	3.64	5.7	2.9
09/01/2024	03 40 09.030	19 17 17.95	19.3422946	19.5737143	3.64	5.7	2.9
09/02/2024	03 40 09.063	19 17 17.81	19.3257137	19.5735483	3.65	5.7	2.9
09/03/2024	03 40 08.884	19 17 16.96	19.3091963	19.5733823	3.65	5.7	2.9
09/04/2024	03 40 08.494	19 17 15.41	19.2927476	19.5732163	3.65	5.7	2.9
09/05/2024	03 40 07.895	19 17 13.14	19.2763725	19.5730503	3.66	5.7	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.
09/06/2024	03 40 07.088	19 17 10.17	19.2600764	19.5728842	3.66	5.7	2.8
09/07/2024	03 40 06.074	19 17 06.51	19.2438641	19.5727181	3.66	5.7	2.8
09/08/2024	03 40 04.856	19 17 02.16	19.2277407	19.5725520	3.67	5.7	2.8
09/09/2024	03 40 03.434	19 16 57.14	19.2117111	19.5723859	3.67	5.7	2.8
09/10/2024	03 40 01.809	19 16 51.45	19.1957803	19.5722197	3.67	5.7	2.8
09/11/2024	03 39 59.982	19 16 45.11	19.1799530	19.5720535	3.67	5.7	2.7
09/12/2024	03 39 57.954	19 16 38.11	19.1642340	19.5718873	3.68	5.7	2.7
09/13/2024	03 39 55.723	19 16 30.47	19.1486280	19.5717211	3.68	5.7	2.7
09/14/2024	03 39 53.290	19 16 22.18	19.1331394	19.5715548	3.68	5.7	2.7
09/15/2024	03 39 50.653	19 16 13.24	19.1177729	19.5713885	3.69	5.7	2.6
09/16/2024	03 39 47.812	19 16 03.64	19.1025327	19.5712222	3.69	5.7	2.6
09/17/2024	03 39 44.769	19 15 53.36	19.0874231	19.5710559	3.69	5.7	2.6
09/18/2024	03 39 41.526	19 15 42.40	19.0724483	19.5708895	3.70	5.7	2.6
09/19/2024	03 39 38.086	19 15 30.76	19.0576125	19.5707232	3.70	5.7	2.5
09/20/2024	03 39 34.454	19 15 18.44	19.0429199	19.5705568	3.70	5.7	2.5
09/21/2024	03 39 30.632	19 15 05.49	19.0283748	19.5703903	3.70	5.7	2.5
09/22/2024	03 39 26.623	19 14 51.90	19.0139816	19.5702239	3.71	5.7	2.5
09/23/2024	03 39 22.427	19 14 37.70	18.9997449	19.5700574	3.71	5.7	2.4
09/24/2024	03 39 18.043	19 14 22.89	18.9856692	19.5698909	3.71	5.7	2.4
09/25/2024	03 39 13.471	19 14 07.47	18.9717592	19.5697244	3.72	5.7	2.4
09/26/2024	03 39 08.710	19 13 51.45	18.9580196	19.5695579	3.72	5.7	2.4
09/27/2024	03 39 03.762	19 13 34.81	18.9444551	19.5693913	3.72	5.7	2.3
09/28/2024	03 38 58.627	19 13 17.55	18.9310705	19.5692247	3.72	5.7	2.3
09/29/2024	03 38 53.306	19 12 59.67	18.9178703	19.5690581	3.73	5.7	2.3
09/30/2024	03 38 47.804	19 12 41.18	18.9048592	19.5688914	3.73	5.7	2.2
10/01/2024	03 38 42.123	19 12 22.07	18.8920418	19.5687248	3.73	5.7	2.2
10/02/2024	03 38 36.265	19 12 02.35	18.8794225	19.5685581	3.73	5.7	2.2
10/03/2024	03 38 30.236	19 11 42.03	18.8670059	19.5683914	3.74	5.6	2.1
10/04/2024	03 38 24.038	19 11 21.13	18.8547962	19.5682247	3.74	5.6	2.1
10/05/2024	03 38 17.675	19 11 05.66	18.8427978	19.5680579	3.74	5.6	2.1
10/06/2024	03 38 11.150	19 10 37.64	18.8310147	19.5678911	3.74	5.6	2.0
10/07/2024	03 38 04.467	19 10 15.09	18.8194510	19.5677243	3.75	5.6	2.0
10/08/2024	03 37 57.628	19 09 52.01	18.8081106	19.5675575	3.75	5.6	1.9
10/09/2024	03 37 50.635	19 09 28.42	18.7969974	19.5673906	3.75	5.6	1.9
10/10/2024	03 37 43.490	19 09 04.33	18.7861151	19.5672238	3.75	5.6	1.8
10/11/2024	03 37 36.195	19 08 39.75	18.7754671	19.5670569	3.75	5.6	1.8
10/12/2024	03 37 28.751	19 08 14.69	18.7650570	19.5668899	3.76	5.6	1.8
10/13/2024	03 37 21.161	19 07 49.12	18.7548878	19.5667230	3.76	5.6	1.7
10/14/2024	03 37 13.426	19 07 23.07	18.7449629	19.5665560	3.76	5.6	1.7
10/15/2024	03 37 05.551	19 06 56.52	18.7352852	19.5663890	3.76	5.6	1.6
10/16/2024	03 36 57.541	19 06 29.47	18.7258575	19.5662220	3.76	5.6	1.6
10/17/2024	03 36 49.401	19 06 01.94	18.7166828	19.5660550	3.77	5.6	1.5
10/18/2024	03 36 41.137	19 05 33.95	18.7077639	19.5658879	3.77	5.6	1.5
10/19/2024	03 36 32.755	19 05 05.54	18.6991037	19.5657208	3.77	5.6	1.5
10/20/2024	03 36 24.256	19 04 36.72	18.6907051	19.5655537	3.77	5.6	1.4
10/21/2024	03 36 15.643	19 04 07.51	18.6825712	19.5653865	3.77	5.6	1.4
10/22/2024	03 36 06.916	19 03 37.92	18.6747050	19.5652194	3.77	5.6	1.3
10/23/2024	03 35 58.077	19 03 07.95	18.6671096	19.5650522	3.78	5.6	1.3
10/24/2024	03 35 49.128	19 02 37.61	18.6597881	19.5648850	3.78	5.6	1.2
10/25/2024	03 35 40.071	19 02 06.90	18.6527434	19.5647177	3.78	5.6	1.2

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		
10/26/2024	03	35	30.910	19	01	35.81	18.6459783	19.5645505	3.78	5.6	1.1
10/27/2024	03	35	21.651	19	01	04.37	18.6394958	19.5643832	3.78	5.6	1.1
10/28/2024	03	35	12.296	19	00	32.57	18.6332985	19.5642159	3.78	5.6	1.0
10/29/2024	03	35	02.853	19	00	00.42	18.6273890	19.5640486	3.78	5.6	1.0
10/30/2024	03	34	53.325	18	59	27.96	18.6217698	19.5638812	3.78	5.6	0.9
10/31/2024	03	34	43.719	18	58	55.19	18.6164432	19.5637138	3.79	5.6	0.9
11/01/2024	03	34	34.039	18	58	22.14	18.6114114	19.5635464	3.79	5.6	0.8
11/02/2024	03	34	24.291	18	57	48.82	18.6066765	19.5633790	3.79	5.6	0.8
11/03/2024	03	34	14.480	18	57	15.27	18.6022404	19.5632115	3.79	5.6	0.7
11/04/2024	03	34	04.609	18	56	41.50	18.5981048	19.5630440	3.79	5.6	0.7
11/05/2024	03	33	54.683	18	56	07.53	18.5942713	19.5628765	3.79	5.6	0.6
11/06/2024	03	33	44.705	18	55	33.38	18.5907413	19.5627090	3.79	5.6	0.6
11/07/2024	03	33	34.677	18	54	59.05	18.5875161	19.5625415	3.79	5.6	0.5
11/08/2024	03	33	24.605	18	54	24.57	18.5845967	19.5623739	3.79	5.6	0.5
11/09/2024	03	33	14.489	18	53	49.93	18.5819840	19.5622063	3.79	5.6	0.4
11/10/2024	03	33	04.336	18	53	15.14	18.5796787	19.5620387	3.79	5.6	0.4
11/11/2024	03	32	54.148	18	52	40.20	18.5776813	19.5618710	3.79	5.6	0.3
11/12/2024	03	32	43.932	18	52	05.12	18.5759924	19.5617033	3.79	5.6	0.3
11/13/2024	03	32	33.695	18	51	29.92	18.5746122	19.5615356	3.79	5.6	0.2
11/14/2024	03	32	23.443	18	50	54.62	18.5735410	19.5613679	3.79	5.6	0.2
11/15/2024	03	32	13.182	18	50	19.24	18.5727790	19.5612001	3.79	5.6	0.1
11/16/2024	03	32	02.919	18	49	43.83	18.5723265	19.5610324	3.79	5.6	0.1
11/17/2024	03	31	52.655	18	49	08.40	18.5721837	19.5608646	3.79	5.6	0.0
11/18/2024	03	31	42.393	18	48	32.98	18.5723509	19.5606967	3.79	5.6	0.1
11/19/2024	03	31	32.135	18	47	57.56	18.5728285	19.5605289	3.79	5.6	0.1
11/20/2024	03	31	21.883	18	47	22.17	18.5736166	19.5603610	3.79	5.6	0.2
11/21/2024	03	31	11.640	18	46	46.80	18.5747156	19.5601931	3.79	5.6	0.2
11/22/2024	03	31	01.411	18	46	11.45	18.5761254	19.5600252	3.79	5.6	0.3
11/23/2024	03	30	51.199	18	45	36.14	18.5778461	19.5598572	3.79	5.6	0.3
11/24/2024	03	30	41.012	18	45	00.89	18.5798775	19.5596892	3.79	5.6	0.4
11/25/2024	03	30	30.854	18	44	25.69	18.5822195	19.5595212	3.79	5.6	0.4
11/26/2024	03	30	20.730	18	43	50.59	18.5848714	19.5593532	3.79	5.6	0.5
11/27/2024	03	30	10.648	18	43	15.59	18.5878328	19.5591852	3.79	5.6	0.5
11/28/2024	03	30	00.613	18	42	40.72	18.5911030	19.5590171	3.79	5.6	0.6
11/29/2024	03	29	50.629	18	42	06.01	18.5946810	19.5588490	3.79	5.6	0.6
11/30/2024	03	29	40.703	18	41	31.48	18.5985658	19.5586808	3.79	5.6	0.7
12/01/2024	03	29	30.839	18	40	57.15	18.6027563	19.5585127	3.79	5.6	0.7
12/02/2024	03	29	21.040	18	40	23.04	18.6072509	19.5583445	3.79	5.6	0.8
12/03/2024	03	29	11.311	18	39	49.19	18.6120483	19.5581763	3.79	5.6	0.8
12/04/2024	03	29	01.654	18	39	15.59	18.6171465	19.5580080	3.79	5.6	0.9
12/05/2024	03	28	52.073	18	38	42.26	18.6225437	19.5578398	3.78	5.6	0.9
12/06/2024	03	28	42.570	18	38	09.21	18.6282378	19.5576715	3.78	5.6	1.0
12/07/2024	03	28	33.149	18	37	36.44	18.6342265	19.5575032	3.78	5.6	1.0
12/08/2024	03	28	23.815	18	37	03.95	18.6405073	19.5573348	3.78	5.6	1.1
12/09/2024	03	28	14.572	18	36	31.76	18.6470778	19.5571665	3.78	5.6	1.1
12/10/2024	03	28	05.427	18	35	59.88	18.6539352	19.5569981	3.78	5.6	1.2
12/11/2024	03	27	56.385	18	35	28.33	18.6610770	19.5568297	3.78	5.6	1.2
12/12/2024	03	27	47.452	18	34	57.14	18.6685002	19.5566612	3.78	5.6	1.3
12/13/2024	03	27	38.634	18	34	26.33	18.6762023	19.5564928	3.77	5.6	1.3
12/14/2024	03	27	29.933	18	33	55.93	18.6841804	19.5563243	3.77	5.6	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.
12/15/2024	03 27 21.352	18 33 25.97	18.6924318	19.5561557	3.77	5.6	1.4
12/16/2024	03 27 12.893	18 32 56.45	18.7009539	19.5559872	3.77	5.6	1.5
12/17/2024	03 27 04.555	18 32 27.38	18.7097440	19.5558186	3.77	5.6	1.5
12/18/2024	03 26 56.341	18 31 58.76	18.7187993	19.5556500	3.77	5.6	1.5
12/19/2024	03 26 48.253	18 31 30.59	18.7281172	19.5554814	3.76	5.6	1.6
12/20/2024	03 26 40.296	18 31 02.88	18.7376947	19.5553128	3.76	5.6	1.6
12/21/2024	03 26 32.472	18 30 35.64	18.7475290	19.5551441	3.76	5.6	1.7
12/22/2024	03 26 24.788	18 30 08.87	18.7576169	19.5549754	3.76	5.6	1.7
12/23/2024	03 26 17.247	18 29 42.60	18.7679553	19.5548067	3.76	5.6	1.8
12/24/2024	03 26 09.854	18 29 16.85	18.7785409	19.5546379	3.75	5.6	1.8
12/25/2024	03 26 02.614	18 28 51.62	18.7893702	19.5544692	3.75	5.6	1.8
12/26/2024	03 25 55.530	18 28 26.95	18.8004397	19.5543004	3.75	5.6	1.9
12/27/2024	03 25 48.607	18 28 02.85	18.8117456	19.5541315	3.75	5.6	1.9
12/28/2024	03 25 41.848	18 27 39.35	18.8232842	19.5539627	3.74	5.6	2.0
12/29/2024	03 25 35.256	18 27 16.46	18.8350515	19.5537938	3.74	5.6	2.0
12/30/2024	03 25 28.833	18 26 54.19	18.8470434	19.5536249	3.74	5.6	2.1
12/31/2024	03 25 22.581	18 26 32.56	18.8592556	19.5534560	3.74	5.6	2.1
01/01/2025	03 25 16.500	18 26 11.58	18.8716838	19.5532870	3.73	5.6	2.1



## 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		
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
01/03/2024	23	43	59.820	-03	04	45.28	30.1759123	29.9037076	2.26	7.9	1.8
01/04/2024	23	44	03.274	-03	04	20.76	30.1924681	29.9036823	2.26	7.9	1.8
01/05/2024	23	44	06.847	-03	03	55.49	30.2089331	29.9036571	2.26	7.9	1.8
01/06/2024	23	44	10.540	-03	03	29.45	30.2253022	29.9036318	2.26	7.9	1.8
01/07/2024	23	44	14.353	-03	03	02.66	30.2415703	29.9036065	2.26	7.9	1.8
01/08/2024	23	44	18.285	-03	02	35.11	30.2577324	29.9035812	2.26	7.9	1.7
01/09/2024	23	44	22.336	-03	02	06.81	30.2737834	29.9035560	2.26	7.9	1.7
01/10/2024	23	44	26.505	-03	01	37.76	30.2897182	29.9035307	2.25	7.9	1.7
01/11/2024	23	44	30.788	-03	01	08.01	30.3055317	29.9035054	2.25	7.9	1.7
01/12/2024	23	44	35.182	-03	00	37.55	30.3212186	29.9034801	2.25	7.9	1.7
01/13/2024	23	44	39.684	-03	00	06.41	30.3367741	29.9034548	2.25	7.9	1.7
01/14/2024	23	44	44.292	-02	59	34.62	30.3521932	29.9034295	2.25	7.9	1.7
01/15/2024	23	44	49.004	-02	59	02.16	30.3674710	29.9034042	2.25	7.9	1.6
01/16/2024	23	44	53.821	-02	58	29.06	30.3826029	29.9033789	2.25	7.9	1.6
01/17/2024	23	44	58.742	-02	57	55.29	30.3975846	29.9033536	2.25	7.9	1.6
01/18/2024	23	45	03.770	-02	57	20.85	30.4124118	29.9033283	2.25	7.9	1.6
01/19/2024	23	45	08.904	-02	56	45.76	30.4270802	29.9033030	2.24	7.9	1.6
01/20/2024	23	45	14.143	-02	56	10.01	30.4415861	29.9032777	2.24	7.9	1.6
01/21/2024	23	45	19.485	-02	55	33.61	30.4559255	29.9032524	2.24	7.9	1.5
01/22/2024	23	45	24.929	-02	54	56.59	30.4700946	29.9032270	2.24	7.9	1.5
01/23/2024	23	45	30.471	-02	54	18.96	30.4840896	29.9032017	2.24	7.9	1.5
01/24/2024	23	45	36.109	-02	53	40.74	30.4979071	29.9031764	2.24	7.9	1.5
01/25/2024	23	45	41.841	-02	53	01.95	30.5115432	29.9031510	2.24	7.9	1.5
01/26/2024	23	45	47.663	-02	52	22.59	30.5249945	29.9031257	2.24	7.9	1.4
01/27/2024	23	45	53.576	-02	51	42.69	30.5382573	29.9031004	2.24	7.9	1.4
01/28/2024	23	45	59.576	-02	51	02.24	30.5513282	29.9030750	2.24	7.9	1.4
01/29/2024	23	46	05.663	-02	50	21.26	30.5642034	29.9030497	2.23	7.9	1.4
01/30/2024	23	46	11.837	-02	49	39.75	30.5768796	29.9030243	2.23	7.9	1.4
01/31/2024	23	46	18.097	-02	48	57.71	30.5893531	29.9029990	2.23	7.9	1.3
02/01/2024	23	46	24.443	-02	48	15.15	30.6016205	29.9029736	2.23	7.9	1.3
02/02/2024	23	46	30.874	-02	47	32.06	30.6136782	29.9029483	2.23	7.9	1.3
02/03/2024	23	46	37.390	-02	46	48.46	30.6255228	29.9029229	2.23	7.9	1.3
02/04/2024	23	46	43.989	-02	46	04.34	30.6371509	29.9028976	2.23	7.9	1.2
02/05/2024	23	46	50.672	-02	45	19.72	30.6485588	29.9028722	2.23	7.9	1.2
02/06/2024	23	46	57.434	-02	44	34.62	30.6597432	29.9028468	2.23	7.9	1.2
02/07/2024	23	47	04.275	-02	43	49.04	30.6707007	29.9028214	2.23	7.9	1.2
02/08/2024	23	47	11.190	-02	43	03.02	30.6814278	29.9027961	2.23	7.9	1.1
02/09/2024	23	47	18.176	-02	42	16.57	30.6919212	29.9027707	2.22	7.9	1.1
02/10/2024	23	47	25.229	-02	41	29.73	30.7021775	29.9027453	2.22	7.9	1.1
02/11/2024	23	47	32.346	-02	40	42.50	30.7121938	29.9027199	2.22	7.9	1.1
02/12/2024	23	47	39.526	-02	39	54.90	30.7219670	29.9026945	2.22	7.9	1.0
02/13/2024	23	47	46.770	-02	39	06.91	30.7314945	29.9026691	2.22	7.9	1.0
02/14/2024	23	47	54.079	-02	38	18.55	30.7407738	29.9026437	2.22	7.9	1.0
02/15/2024	23	48	01.451	-02	37	29.80	30.7498026	29.9026183	2.22	7.9	0.9
02/16/2024	23	48	08.886	-02	36	40.69	30.7585787	29.9025929	2.22	7.9	0.9
02/17/2024	23	48	16.382	-02	35	51.21	30.7671002	29.9025675	2.22	7.9	0.9
02/18/2024	23	48	23.936	-02	35	01.40	30.7753653	29.9025421	2.22	7.9	0.9

## 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		
02/19/2024	23	48	31.545	-02	34	11.28	30.7833720	29.9025167	2.22	7.9	0.8
02/20/2024	23	48	39.207	-02	33	20.86	30.7911188	29.9024913	2.22	8.0	0.8
02/21/2024	23	48	46.917	-02	32	30.15	30.7986040	29.9024658	2.22	8.0	0.8
02/22/2024	23	48	54.674	-02	31	39.19	30.8058259	29.9024404	2.22	8.0	0.7
02/23/2024	23	49	02.474	-02	30	47.99	30.8127830	29.9024150	2.22	8.0	0.7
02/24/2024	23	49	10.317	-02	29	56.55	30.8194737	29.9023895	2.22	8.0	0.7
02/25/2024	23	49	18.201	-02	29	04.88	30.8258965	29.9023641	2.22	8.0	0.7
02/26/2024	23	49	26.125	-02	28	12.99	30.8320499	29.9023386	2.21	8.0	0.6
02/27/2024	23	49	34.088	-02	27	20.89	30.8379326	29.9023132	2.21	8.0	0.6
02/28/2024	23	49	42.089	-02	26	28.59	30.8435429	29.9022877	2.21	8.0	0.6
02/29/2024	23	49	50.127	-02	25	36.07	30.8488796	29.9022623	2.21	8.0	0.5
03/01/2024	23	49	58.203	-02	24	43.36	30.8539412	29.9022368	2.21	8.0	0.5
03/02/2024	23	50	06.313	-02	23	50.46	30.8587264	29.9022114	2.21	8.0	0.5
03/03/2024	23	50	14.458	-02	22	57.37	30.8632339	29.9021859	2.21	8.0	0.5
03/04/2024	23	50	22.635	-02	22	04.12	30.8674622	29.9021604	2.21	8.0	0.4
03/05/2024	23	50	30.841	-02	21	10.72	30.8714102	29.9021349	2.21	8.0	0.4
03/06/2024	23	50	39.074	-02	20	17.19	30.8750767	29.9021094	2.21	8.0	0.4
03/07/2024	23	50	47.329	-02	19	23.56	30.8784603	29.9020840	2.21	8.0	0.3
03/08/2024	23	50	55.602	-02	18	29.84	30.8815600	29.9020585	2.21	8.0	0.3
03/09/2024	23	51	03.891	-02	17	36.07	30.8843749	29.9020330	2.21	8.0	0.3
03/10/2024	23	51	12.193	-02	16	42.26	30.8869039	29.9020075	2.21	8.0	0.2
03/11/2024	23	51	20.508	-02	15	48.40	30.8891466	29.9019820	2.21	8.0	0.2
03/12/2024	23	51	28.836	-02	14	54.49	30.8911024	29.9019565	2.21	8.0	0.2
03/13/2024	23	51	37.178	-02	14	00.54	30.8927711	29.9019309	2.21	8.0	0.1
03/14/2024	23	51	45.532	-02	13	06.54	30.8941529	29.9019054	2.21	8.0	0.1
03/15/2024	23	51	53.897	-02	12	12.52	30.8952478	29.9018799	2.21	8.0	0.1
03/16/2024	23	52	02.271	-02	11	18.49	30.8960561	29.9018544	2.21	8.0	0.1
03/17/2024	23	52	10.649	-02	10	24.47	30.8965783	29.9018288	2.21	8.0	0.0
03/18/2024	23	52	19.029	-02	09	30.48	30.8968149	29.9018033	2.21	8.0	0.1
03/19/2024	23	52	27.407	-02	08	36.55	30.8967662	29.9017778	2.21	8.0	0.1
03/20/2024	23	52	35.781	-02	07	42.69	30.8964330	29.9017522	2.21	8.0	0.1
03/21/2024	23	52	44.148	-02	06	48.92	30.8958157	29.9017267	2.21	8.0	0.1
03/22/2024	23	52	52.507	-02	05	55.25	30.8949150	29.9017011	2.21	8.0	0.2
03/23/2024	23	53	00.856	-02	05	01.68	30.8937316	29.9016756	2.21	8.0	0.2
03/24/2024	23	53	09.193	-02	04	08.24	30.8922660	29.9016500	2.21	8.0	0.2
03/25/2024	23	53	17.518	-02	03	14.91	30.8905191	29.9016244	2.21	8.0	0.2
03/26/2024	23	53	25.830	-02	02	21.70	30.8884916	29.9015989	2.21	8.0	0.3
03/27/2024	23	53	34.129	-02	01	28.63	30.8861840	29.9015733	2.21	8.0	0.3
03/28/2024	23	53	42.414	-02	00	35.68	30.8835973	29.9015477	2.21	8.0	0.3
03/29/2024	23	53	50.683	-01	59	42.88	30.8807322	29.9015221	2.21	8.0	0.4
03/30/2024	23	53	58.935	-01	58	50.23	30.8775895	29.9014965	2.21	8.0	0.4
03/31/2024	23	54	07.169	-01	57	57.74	30.8741699	29.9014709	2.21	8.0	0.4
04/01/2024	23	54	15.382	-01	57	05.43	30.8704743	29.9014454	2.21	8.0	0.5
04/02/2024	23	54	23.570	-01	56	13.32	30.8665036	29.9014198	2.21	8.0	0.5
04/03/2024	23	54	31.731	-01	55	21.43	30.8622587	29.9013942	2.21	8.0	0.5
04/04/2024	23	54	39.862	-01	54	29.77	30.8577405	29.9013685	2.21	8.0	0.6
04/05/2024	23	54	47.958	-01	53	38.38	30.8529501	29.9013429	2.21	8.0	0.6
04/06/2024	23	54	56.018	-01	52	47.27	30.8478887	29.9013173	2.21	8.0	0.6
04/07/2024	23	55	04.041	-01	51	56.44	30.8425576	29.9012917	2.21	8.0	0.6
04/08/2024	23	55	12.026	-01	51	05.89	30.8369584	29.9012661	2.21	8.0	0.7

## 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.
04/09/2024	23 55 19.973	-01 50 15.63	30.8310926	29.9012405	2.21	8.0	0.7
04/10/2024	23 55 27.884	-01 49 25.64	30.8249624	29.9012148	2.22	8.0	0.7
04/11/2024	23 55 35.757	-01 48 35.94	30.8185697	29.9011892	2.22	8.0	0.8
04/12/2024	23 55 43.590	-01 47 46.54	30.8119170	29.9011635	2.22	8.0	0.8
04/13/2024	23 55 51.380	-01 46 57.46	30.8050065	29.9011379	2.22	8.0	0.8
04/14/2024	23 55 59.123	-01 46 08.73	30.7978406	29.9011123	2.22	8.0	0.9
04/15/2024	23 56 06.817	-01 45 20.36	30.7904220	29.9010866	2.22	8.0	0.9
04/16/2024	23 56 14.458	-01 44 32.37	30.7827530	29.9010609	2.22	7.9	0.9
04/17/2024	23 56 22.044	-01 43 44.78	30.7748363	29.9010353	2.22	7.9	0.9
04/18/2024	23 56 29.574	-01 42 57.60	30.7666743	29.9010096	2.22	7.9	1.0
04/19/2024	23 56 37.045	-01 42 10.83	30.7582696	29.9009840	2.22	7.9	1.0
04/20/2024	23 56 44.459	-01 41 24.48	30.7496247	29.9009583	2.22	7.9	1.0
04/21/2024	23 56 51.812	-01 40 38.56	30.7407423	29.9009326	2.22	7.9	1.1
04/22/2024	23 56 59.106	-01 39 53.06	30.7316249	29.9009069	2.22	7.9	1.1
04/23/2024	23 57 06.339	-01 39 07.99	30.7222750	29.9008812	2.22	7.9	1.1
04/24/2024	23 57 13.512	-01 38 23.36	30.7126952	29.9008555	2.22	7.9	1.1
04/25/2024	23 57 20.623	-01 37 39.15	30.7028882	29.9008299	2.22	7.9	1.2
04/26/2024	23 57 27.672	-01 36 55.39	30.6928565	29.9008042	2.22	7.9	1.2
04/27/2024	23 57 34.657	-01 36 12.08	30.6826026	29.9007785	2.23	7.9	1.2
04/28/2024	23 57 41.576	-01 35 29.23	30.6721291	29.9007527	2.23	7.9	1.2
04/29/2024	23 57 48.426	-01 34 46.87	30.6614386	29.9007270	2.23	7.9	1.3
04/30/2024	23 57 55.205	-01 34 05.00	30.6505338	29.9007013	2.23	7.9	1.3
05/01/2024	23 58 01.910	-01 33 23.65	30.6394173	29.9006756	2.23	7.9	1.3
05/02/2024	23 58 08.537	-01 32 42.84	30.6280919	29.9006499	2.23	7.9	1.3
05/03/2024	23 58 15.085	-01 32 02.57	30.6165603	29.9006241	2.23	7.9	1.3
05/04/2024	23 58 21.552	-01 31 22.86	30.6048256	29.9005984	2.23	7.9	1.4
05/05/2024	23 58 27.939	-01 30 43.71	30.5928907	29.9005727	2.23	7.9	1.4
05/06/2024	23 58 34.245	-01 30 05.11	30.5807591	29.9005469	2.23	7.9	1.4
05/07/2024	23 58 40.472	-01 29 27.06	30.5684340	29.9005212	2.23	7.9	1.4
05/08/2024	23 58 46.620	-01 28 49.56	30.5559191	29.9004954	2.23	7.9	1.5
05/09/2024	23 58 52.687	-01 28 12.61	30.5432183	29.9004697	2.24	7.9	1.5
05/10/2024	23 58 58.671	-01 27 36.24	30.5303352	29.9004439	2.24	7.9	1.5
05/11/2024	23 59 04.569	-01 27 00.45	30.5172740	29.9004182	2.24	7.9	1.5
05/12/2024	23 59 10.378	-01 26 25.28	30.5040386	29.9003924	2.24	7.9	1.5
05/13/2024	23 59 16.095	-01 25 50.73	30.4906330	29.9003666	2.24	7.9	1.6
05/14/2024	23 59 21.719	-01 25 16.82	30.4770613	29.9003409	2.24	7.9	1.6
05/15/2024	23 59 27.248	-01 24 43.56	30.4633273	29.9003151	2.24	7.9	1.6
05/16/2024	23 59 32.680	-01 24 10.96	30.4494352	29.9002893	2.24	7.9	1.6
05/17/2024	23 59 38.016	-01 23 39.01	30.4353887	29.9002635	2.24	7.9	1.6
05/18/2024	23 59 43.255	-01 23 07.71	30.4211920	29.9002377	2.24	7.9	1.7
05/19/2024	23 59 48.396	-01 22 37.08	30.4068489	29.9002119	2.25	7.9	1.7
05/20/2024	23 59 53.442	-01 22 07.09	30.3923633	29.9001861	2.25	7.9	1.7
05/21/2024	23 59 58.390	-01 21 37.77	30.3777392	29.9001603	2.25	7.9	1.7
05/22/2024	00 00 03.241	-01 21 09.09	30.3629804	29.9001345	2.25	7.9	1.7
05/23/2024	00 00 07.996	-01 20 41.07	30.3480907	29.9001087	2.25	7.9	1.7
05/24/2024	00 00 12.653	-01 20 13.71	30.3330740	29.9000829	2.25	7.9	1.7
05/25/2024	00 00 17.210	-01 19 47.02	30.3179341	29.9000571	2.25	7.9	1.8
05/26/2024	00 00 21.666	-01 19 21.01	30.3026748	29.9000312	2.25	7.9	1.8
05/27/2024	00 00 26.018	-01 18 55.69	30.2872998	29.9000054	2.25	7.9	1.8
05/28/2024	00 00 30.264	-01 18 31.08	30.2718130	29.8999796	2.26	7.9	1.8

## 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		
05/29/2024	00	00	34.402	-01	18	07.20	30.2562181	29.8999537	2.26	7.9	1.8
05/30/2024	00	00	38.429	-01	17	44.06	30.2405193	29.8999279	2.26	7.9	1.8
05/31/2024	00	00	42.345	-01	17	21.66	30.2247203	29.8999021	2.26	7.9	1.8
06/01/2024	00	00	46.151	-01	16	59.99	30.2088255	29.8998762	2.26	7.9	1.8
06/02/2024	00	00	49.846	-01	16	39.06	30.1928390	29.8998504	2.26	7.9	1.9
06/03/2024	00	00	53.433	-01	16	18.85	30.1767652	29.8998245	2.26	7.9	1.9
06/04/2024	00	00	56.912	-01	15	59.36	30.1606088	29.8997987	2.26	7.9	1.9
06/05/2024	00	01	00.283	-01	15	40.59	30.1443743	29.8997728	2.27	7.9	1.9
06/06/2024	00	01	03.544	-01	15	22.55	30.1280666	29.8997469	2.27	7.9	1.9
06/07/2024	00	01	06.694	-01	15	05.24	30.1116905	29.8997211	2.27	7.9	1.9
06/08/2024	00	01	09.730	-01	14	48.70	30.0952510	29.8996952	2.27	7.9	1.9
06/09/2024	00	01	12.651	-01	14	32.92	30.0787528	29.8996693	2.27	7.9	1.9
06/10/2024	00	01	15.453	-01	14	17.92	30.0622009	29.8996434	2.27	7.9	1.9
06/11/2024	00	01	18.137	-01	14	03.70	30.0456002	29.8996175	2.27	7.9	1.9
06/12/2024	00	01	20.701	-01	13	50.28	30.0289554	29.8995917	2.27	7.9	1.9
06/13/2024	00	01	23.146	-01	13	37.64	30.0122713	29.8995658	2.28	7.9	1.9
06/14/2024	00	01	25.472	-01	13	25.79	29.9955526	29.8995399	2.28	7.9	1.9
06/15/2024	00	01	27.680	-01	13	14.71	29.9788041	29.8995140	2.28	7.9	1.9
06/16/2024	00	01	29.770	-01	13	04.40	29.9620302	29.8994881	2.28	7.9	1.9
06/17/2024	00	01	31.744	-01	12	54.86	29.9452357	29.8994622	2.28	7.9	1.9
06/18/2024	00	01	33.602	-01	12	46.08	29.9284251	29.8994363	2.28	7.9	2.0
06/19/2024	00	01	35.344	-01	12	38.06	29.9116028	29.8994104	2.28	7.9	2.0
06/20/2024	00	01	36.971	-01	12	30.79	29.8947733	29.8993845	2.28	7.9	2.0
06/21/2024	00	01	38.483	-01	12	24.28	29.8779411	29.8993585	2.29	7.9	2.0
06/22/2024	00	01	39.877	-01	12	18.53	29.8611103	29.8993326	2.29	7.9	2.0
06/23/2024	00	01	41.153	-01	12	13.55	29.8442854	29.8993067	2.29	7.9	2.0
06/24/2024	00	01	42.309	-01	12	09.35	29.8274706	29.8992808	2.29	7.9	1.9
06/25/2024	00	01	43.343	-01	12	05.95	29.8106702	29.8992549	2.29	7.9	1.9
06/26/2024	00	01	44.254	-01	12	03.35	29.7938886	29.8992289	2.29	7.9	1.9
06/27/2024	00	01	45.041	-01	12	01.55	29.7771301	29.8992030	2.29	7.9	1.9
06/28/2024	00	01	45.705	-01	12	00.55	29.7603992	29.8991771	2.29	7.9	1.9
06/29/2024	00	01	46.249	-01	12	00.33	29.7437005	29.8991512	2.30	7.9	1.9
06/30/2024	00	01	46.674	-01	12	00.88	29.7270388	29.8991252	2.30	7.9	1.9
07/01/2024	00	01	46.981	-01	12	02.19	29.7104189	29.8990993	2.30	7.9	1.9
07/02/2024	00	01	47.172	-01	12	04.26	29.6938456	29.8990734	2.30	7.9	1.9
07/03/2024	00	01	47.246	-01	12	07.08	29.6773240	29.8990474	2.30	7.9	1.9
07/04/2024	00	01	47.202	-01	12	10.66	29.6608591	29.8990215	2.30	7.9	1.9
07/05/2024	00	01	47.040	-01	12	15.01	29.6444560	29.8989955	2.30	7.9	1.9
07/06/2024	00	01	46.757	-01	12	20.13	29.6281197	29.8989696	2.30	7.9	1.9
07/07/2024	00	01	46.353	-01	12	26.04	29.6118552	29.8989436	2.31	7.9	1.9
07/08/2024	00	01	45.827	-01	12	32.73	29.5956675	29.8989177	2.31	7.9	1.9
07/09/2024	00	01	45.179	-01	12	40.20	29.5795614	29.8988917	2.31	7.9	1.9
07/10/2024	00	01	44.410	-01	12	48.45	29.5635419	29.8988658	2.31	7.9	1.9
07/11/2024	00	01	43.521	-01	12	57.47	29.5476136	29.8988398	2.31	7.9	1.8
07/12/2024	00	01	42.514	-01	13	07.25	29.5317813	29.8988139	2.31	7.9	1.8
07/13/2024	00	01	41.390	-01	13	17.77	29.5160494	29.8987879	2.31	7.9	1.8
07/14/2024	00	01	40.151	-01	13	29.03	29.5004226	29.8987620	2.31	7.9	1.8
07/15/2024	00	01	38.798	-01	13	41.01	29.4849052	29.8987360	2.32	7.9	1.8
07/16/2024	00	01	37.334	-01	13	53.70	29.4695017	29.8987101	2.32	7.9	1.8
07/17/2024	00	01	35.759	-01	14	07.09	29.4542162	29.8986841	2.32	7.9	1.8

## 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		
07/18/2024	00	01	34.074	-01	14	21.18	29.4390531	29.8986581	2.32	7.9	1.8
07/19/2024	00	01	32.279	-01	14	35.96	29.4240165	29.8986322	2.32	7.9	1.7
07/20/2024	00	01	30.374	-01	14	51.44	29.4091103	29.8986062	2.32	7.9	1.7
07/21/2024	00	01	28.357	-01	15	07.62	29.3943385	29.8985802	2.32	7.8	1.7
07/22/2024	00	01	26.229	-01	15	24.51	29.3797052	29.8985542	2.32	7.8	1.7
07/23/2024	00	01	23.987	-01	15	42.11	29.3652141	29.8985283	2.33	7.8	1.7
07/24/2024	00	01	21.633	-01	16	00.43	29.3508692	29.8985023	2.33	7.8	1.7
07/25/2024	00	01	19.168	-01	16	19.44	29.3366745	29.8984763	2.33	7.8	1.6
07/26/2024	00	01	16.594	-01	16	39.13	29.3226342	29.8984503	2.33	7.8	1.6
07/27/2024	00	01	13.915	-01	16	59.48	29.3087524	29.8984244	2.33	7.8	1.6
07/28/2024	00	01	11.133	-01	17	20.47	29.2950333	29.8983984	2.33	7.8	1.6
07/29/2024	00	01	08.250	-01	17	42.10	29.2814814	29.8983724	2.33	7.8	1.6
07/30/2024	00	01	05.267	-01	18	04.35	29.2681009	29.8983464	2.33	7.8	1.6
07/31/2024	00	01	02.185	-01	18	27.22	29.2548962	29.8983204	2.33	7.8	1.5
08/01/2024	00	00	59.002	-01	18	50.71	29.2418717	29.8982944	2.34	7.8	1.5
08/02/2024	00	00	55.719	-01	19	14.83	29.2290318	29.8982684	2.34	7.8	1.5
08/03/2024	00	00	52.336	-01	19	39.57	29.2163806	29.8982425	2.34	7.8	1.5
08/04/2024	00	00	48.852	-01	20	04.93	29.2039224	29.8982165	2.34	7.8	1.4
08/05/2024	00	00	45.270	-01	20	30.90	29.1916613	29.8981905	2.34	7.8	1.4
08/06/2024	00	00	41.589	-01	20	57.48	29.1796013	29.8981645	2.34	7.8	1.4
08/07/2024	00	00	37.812	-01	21	24.65	29.1677461	29.8981385	2.34	7.8	1.4
08/08/2024	00	00	33.942	-01	21	52.40	29.1560996	29.8981125	2.34	7.8	1.4
08/09/2024	00	00	29.982	-01	22	20.70	29.1446655	29.8980865	2.34	7.8	1.3
08/10/2024	00	00	25.933	-01	22	49.54	29.1334472	29.8980605	2.34	7.8	1.3
08/11/2024	00	00	21.798	-01	23	18.89	29.1224483	29.8980345	2.34	7.8	1.3
08/12/2024	00	00	17.580	-01	23	48.75	29.1116720	29.8980085	2.35	7.8	1.2
08/13/2024	00	00	13.281	-01	24	19.10	29.1011215	29.8979825	2.35	7.8	1.2
08/14/2024	00	00	08.903	-01	24	49.92	29.0907999	29.8979564	2.35	7.8	1.2
08/15/2024	00	00	04.447	-01	25	21.21	29.0807102	29.8979304	2.35	7.8	1.2
08/16/2024	23	59	59.914	-01	25	52.96	29.0708553	29.8979044	2.35	7.8	1.1
08/17/2024	23	59	55.304	-01	26	25.17	29.0612379	29.8978784	2.35	7.8	1.1
08/18/2024	23	59	50.618	-01	26	57.83	29.0518607	29.8978524	2.35	7.8	1.1
08/19/2024	23	59	45.855	-01	27	30.95	29.0427263	29.8978264	2.35	7.8	1.1
08/20/2024	23	59	41.016	-01	28	04.52	29.0338372	29.8978004	2.35	7.8	1.0
08/21/2024	23	59	36.102	-01	28	38.54	29.0251960	29.8977743	2.35	7.8	1.0
08/22/2024	23	59	31.117	-01	29	12.96	29.0168054	29.8977483	2.35	7.8	1.0
08/23/2024	23	59	26.065	-01	29	47.79	29.0086680	29.8977223	2.35	7.8	0.9
08/24/2024	23	59	20.950	-01	30	22.97	29.0007866	29.8976963	2.35	7.8	0.9
08/25/2024	23	59	15.775	-01	30	58.50	28.9931639	29.8976702	2.36	7.8	0.9
08/26/2024	23	59	10.542	-01	31	34.37	28.9858029	29.8976442	2.36	7.8	0.9
08/27/2024	23	59	05.252	-01	32	10.56	28.9787063	29.8976182	2.36	7.8	0.8
08/28/2024	23	58	59.906	-01	32	47.07	28.9718769	29.8975921	2.36	7.8	0.8
08/29/2024	23	58	54.503	-01	33	23.90	28.9653173	29.8975661	2.36	7.8	0.8
08/30/2024	23	58	49.045	-01	34	01.04	28.9590303	29.8975401	2.36	7.8	0.7
08/31/2024	23	58	43.533	-01	34	38.49	28.9530181	29.8975140	2.36	7.8	0.7
09/01/2024	23	58	37.969	-01	35	16.23	28.9472832	29.8974880	2.36	7.8	0.7
09/02/2024	23	58	32.354	-01	35	54.25	28.9418278	29.8974619	2.36	7.8	0.6
09/03/2024	23	58	26.691	-01	36	32.53	28.9366540	29.8974359	2.36	7.8	0.6
09/04/2024	23	58	20.983	-01	37	11.05	28.9317636	29.8974098	2.36	7.8	0.6
09/05/2024	23	58	15.233	-01	37	49.80	28.9271586	29.8973838	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		
09/06/2024	23	58	09.446	-01	38	28.74	28.9228406	29.8973577	2.36	7.8	0.5
09/07/2024	23	58	03.623	-01	39	07.85	28.9188110	29.8973317	2.36	7.8	0.5
09/08/2024	23	57	57.769	-01	39	47.12	28.9150713	29.8973056	2.36	7.8	0.4
09/09/2024	23	57	51.886	-01	40	26.52	28.9116227	29.8972796	2.36	7.8	0.4
09/10/2024	23	57	45.977	-01	41	06.04	28.9084662	29.8972535	2.36	7.8	0.4
09/11/2024	23	57	40.043	-01	41	45.66	28.9056028	29.8972274	2.36	7.8	0.3
09/12/2024	23	57	34.087	-01	42	25.37	28.9030334	29.8972014	2.36	7.8	0.3
09/13/2024	23	57	28.110	-01	43	05.17	28.9007586	29.8971753	2.36	7.8	0.3
09/14/2024	23	57	22.113	-01	43	45.05	28.8987790	29.8971492	2.36	7.8	0.2
09/15/2024	23	57	16.096	-01	44	25.00	28.8970951	29.8971232	2.36	7.8	0.2
09/16/2024	23	57	10.060	-01	45	05.02	28.8957072	29.8970971	2.36	7.8	0.2
09/17/2024	23	57	04.007	-01	45	45.09	28.8946158	29.8970710	2.36	7.8	0.1
09/18/2024	23	56	57.940	-01	46	25.20	28.8938210	29.8970449	2.36	7.8	0.1
09/19/2024	23	56	51.863	-01	47	05.32	28.8933233	29.8970189	2.36	7.8	0.1
09/20/2024	23	56	45.781	-01	47	45.42	28.8931232	29.8969928	2.36	7.8	0.1
09/21/2024	23	56	39.698	-01	48	25.47	28.8932210	29.8969667	2.36	7.8	0.0
09/22/2024	23	56	33.618	-01	49	05.45	28.8936173	29.8969406	2.36	7.8	0.0
09/23/2024	23	56	27.541	-01	49	45.35	28.8943125	29.8969145	2.36	7.8	0.1
09/24/2024	23	56	21.468	-01	50	25.17	28.8953072	29.8968884	2.36	7.8	0.1
09/25/2024	23	56	15.401	-01	51	04.91	28.8966016	29.8968624	2.36	7.8	0.1
09/26/2024	23	56	09.340	-01	51	44.55	28.8981960	29.8968363	2.36	7.8	0.2
09/27/2024	23	56	03.286	-01	52	24.09	28.9000904	29.8968102	2.36	7.8	0.2
09/28/2024	23	55	57.241	-01	53	03.52	28.9022847	29.8967841	2.36	7.8	0.2
09/29/2024	23	55	51.208	-01	53	42.82	28.9047789	29.8967580	2.36	7.8	0.3
09/30/2024	23	55	45.190	-01	54	21.97	28.9075724	29.8967319	2.36	7.8	0.3
10/01/2024	23	55	39.189	-01	55	00.95	28.9106647	29.8967058	2.36	7.8	0.3
10/02/2024	23	55	33.208	-01	55	39.74	28.9140552	29.8966797	2.36	7.8	0.4
10/03/2024	23	55	27.253	-01	56	18.32	28.9177431	29.8966536	2.36	7.8	0.4
10/04/2024	23	55	21.325	-01	56	56.66	28.9217273	29.8966275	2.36	7.8	0.4
10/05/2024	23	55	15.429	-01	57	34.74	28.9260068	29.8966014	2.36	7.8	0.5
10/06/2024	23	55	09.568	-01	58	12.54	28.9305801	29.8965753	2.36	7.8	0.5
10/07/2024	23	55	03.744	-01	58	50.05	28.9354460	29.8965491	2.36	7.8	0.5
10/08/2024	23	54	57.959	-01	59	27.25	28.9406028	29.8965230	2.36	7.8	0.6
10/09/2024	23	54	52.215	-02	00	04.12	28.9460487	29.8964969	2.36	7.8	0.6
10/10/2024	23	54	46.514	-02	00	40.67	28.9517821	29.8964708	2.36	7.8	0.6
10/11/2024	23	54	40.857	-02	01	16.88	28.9578008	29.8964447	2.36	7.8	0.7
10/12/2024	23	54	35.244	-02	01	52.75	28.9641028	29.8964185	2.36	7.8	0.7
10/13/2024	23	54	29.677	-02	02	28.27	28.9706860	29.8963924	2.36	7.8	0.7
10/14/2024	23	54	24.156	-02	03	03.43	28.9775482	29.8963663	2.36	7.8	0.7
10/15/2024	23	54	18.685	-02	03	38.23	28.9846870	29.8963402	2.36	7.8	0.8
10/16/2024	23	54	13.266	-02	04	12.63	28.9921002	29.8963140	2.36	7.8	0.8
10/17/2024	23	54	07.904	-02	04	46.62	28.9997856	29.8962879	2.35	7.8	0.8
10/18/2024	23	54	02.603	-02	05	20.15	29.0077410	29.8962618	2.35	7.8	0.9
10/19/2024	23	53	57.367	-02	05	53.22	29.0159643	29.8962356	2.35	7.8	0.9
10/20/2024	23	53	52.197	-02	06	25.81	29.0244534	29.8962095	2.35	7.8	0.9
10/21/2024	23	53	47.096	-02	06	57.91	29.0332063	29.8961833	2.35	7.8	1.0
10/22/2024	23	53	42.062	-02	07	29.52	29.0422207	29.8961572	2.35	7.8	1.0
10/23/2024	23	53	37.096	-02	08	00.65	29.0514944	29.8961310	2.35	7.8	1.0
10/24/2024	23	53	32.198	-02	08	31.29	29.0610250	29.8961049	2.35	7.8	1.0
10/25/2024	23	53	27.371	-02	09	01.44	29.0708098	29.8960787	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		
10/26/2024	23	53	22.615	-02	09	31.07	29.0808463	29.8960526	2.35	7.8	1.1
10/27/2024	23	53	17.933	-02	10	00.18	29.0911315	29.8960264	2.35	7.8	1.1
10/28/2024	23	53	13.328	-02	10	28.75	29.1016625	29.8960002	2.35	7.8	1.1
10/29/2024	23	53	08.802	-02	10	56.76	29.1124360	29.8959741	2.35	7.8	1.2
10/30/2024	23	53	04.359	-02	11	24.18	29.1234490	29.8959479	2.34	7.8	1.2
10/31/2024	23	53	00.002	-02	11	51.01	29.1346979	29.8959217	2.34	7.8	1.2
11/01/2024	23	52	55.734	-02	12	17.22	29.1461792	29.8958955	2.34	7.8	1.3
11/02/2024	23	52	51.557	-02	12	42.80	29.1578892	29.8958694	2.34	7.8	1.3
11/03/2024	23	52	47.473	-02	13	07.73	29.1698241	29.8958432	2.34	7.8	1.3
11/04/2024	23	52	43.484	-02	13	32.00	29.1819801	29.8958170	2.34	7.8	1.3
11/05/2024	23	52	39.592	-02	13	55.61	29.1943530	29.8957908	2.34	7.8	1.4
11/06/2024	23	52	35.796	-02	14	18.55	29.2069387	29.8957646	2.34	7.8	1.4
11/07/2024	23	52	32.099	-02	14	40.82	29.2197331	29.8957384	2.34	7.8	1.4
11/08/2024	23	52	28.499	-02	15	02.42	29.2327316	29.8957122	2.34	7.8	1.4
11/09/2024	23	52	24.997	-02	15	23.35	29.2459301	29.8956860	2.33	7.8	1.4
11/10/2024	23	52	21.593	-02	15	43.61	29.2593241	29.8956598	2.33	7.8	1.5
11/11/2024	23	52	18.289	-02	16	03.18	29.2729090	29.8956336	2.33	7.8	1.5
11/12/2024	23	52	15.088	-02	16	22.06	29.2866806	29.8956074	2.33	7.8	1.5
11/13/2024	23	52	11.991	-02	16	40.22	29.3006344	29.8955812	2.33	7.8	1.5
11/14/2024	23	52	09.003	-02	16	57.65	29.3147661	29.8955550	2.33	7.8	1.5
11/15/2024	23	52	06.127	-02	17	14.32	29.3290715	29.8955288	2.33	7.8	1.6
11/16/2024	23	52	03.364	-02	17	30.23	29.3435463	29.8955026	2.33	7.8	1.6
11/17/2024	23	52	00.715	-02	17	45.37	29.3581866	29.8954763	2.33	7.8	1.6
11/18/2024	23	51	58.180	-02	17	59.74	29.3729880	29.8954501	2.32	7.8	1.6
11/19/2024	23	51	55.758	-02	18	13.36	29.3879465	29.8954239	2.32	7.8	1.6
11/20/2024	23	51	53.448	-02	18	26.24	29.4030579	29.8953977	2.32	7.8	1.6
11/21/2024	23	51	51.249	-02	18	38.36	29.4183177	29.8953714	2.32	7.9	1.7
11/22/2024	23	51	49.163	-02	18	49.73	29.4337215	29.8953452	2.32	7.9	1.7
11/23/2024	23	51	47.190	-02	19	00.34	29.4492647	29.8953190	2.32	7.9	1.7
11/24/2024	23	51	45.333	-02	19	10.19	29.4649426	29.8952927	2.32	7.9	1.7
11/25/2024	23	51	43.593	-02	19	19.24	29.4807504	29.8952665	2.32	7.9	1.7
11/26/2024	23	51	41.973	-02	19	27.51	29.4966831	29.8952402	2.32	7.9	1.7
11/27/2024	23	51	40.474	-02	19	34.96	29.5127358	29.8952140	2.31	7.9	1.7
11/28/2024	23	51	39.098	-02	19	41.59	29.5289034	29.8951877	2.31	7.9	1.8
11/29/2024	23	51	37.847	-02	19	47.40	29.5451806	29.8951615	2.31	7.9	1.8
11/30/2024	23	51	36.723	-02	19	52.37	29.5615623	29.8951352	2.31	7.9	1.8
12/01/2024	23	51	35.725	-02	19	56.50	29.5780430	29.8951089	2.31	7.9	1.8
12/02/2024	23	51	34.854	-02	19	59.79	29.5946174	29.8950827	2.31	7.9	1.8
12/03/2024	23	51	34.111	-02	20	02.24	29.6112800	29.8950564	2.31	7.9	1.8
12/04/2024	23	51	33.494	-02	20	03.87	29.6280251	29.8950301	2.30	7.9	1.8
12/05/2024	23	51	33.002	-02	20	04.66	29.6448474	29.8950039	2.30	7.9	1.8
12/06/2024	23	51	32.634	-02	20	04.64	29.6617410	29.8949776	2.30	7.9	1.8
12/07/2024	23	51	32.390	-02	20	03.81	29.6787006	29.8949513	2.30	7.9	1.8
12/08/2024	23	51	32.270	-02	20	02.16	29.6957204	29.8949250	2.30	7.9	1.8
12/09/2024	23	51	32.275	-02	19	59.69	29.7127952	29.8948987	2.30	7.9	1.9
12/10/2024	23	51	32.406	-02	19	56.40	29.7299193	29.8948725	2.30	7.9	1.9
12/11/2024	23	51	32.665	-02	19	52.27	29.7470876	29.8948462	2.30	7.9	1.9
12/12/2024	23	51	33.055	-02	19	47.28	29.7642947	29.8948199	2.29	7.9	1.9
12/13/2024	23	51	33.576	-02	19	41.44	29.7815356	29.8947936	2.29	7.9	1.9
12/14/2024	23	51	34.229	-02	19	34.74	29.7988054	29.8947673	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.
12/15/2024	23 51 35.013	-02 19 27.19	29.8160990	29.8947410	2.29	7.9	1.9
12/16/2024	23 51 35.925	-02 19 18.81	29.8334115	29.8947147	2.29	7.9	1.9
12/17/2024	23 51 36.964	-02 19 09.62	29.8507381	29.8946884	2.29	7.9	1.9
12/18/2024	23 51 38.127	-02 18 59.61	29.8680738	29.8946621	2.29	7.9	1.9
12/19/2024	23 51 39.414	-02 18 48.81	29.8854136	29.8946358	2.29	7.9	1.9
12/20/2024	23 51 40.825	-02 18 37.20	29.9027524	29.8946095	2.28	7.9	1.9
12/21/2024	23 51 42.360	-02 18 24.80	29.9200852	29.8945832	2.28	7.9	1.9
12/22/2024	23 51 44.020	-02 18 11.58	29.9374066	29.8945569	2.28	7.9	1.9
12/23/2024	23 51 45.805	-02 17 57.56	29.9547115	29.8945306	2.28	7.9	1.9
12/24/2024	23 51 47.717	-02 17 42.71	29.9719946	29.8945043	2.28	7.9	1.9
12/25/2024	23 51 49.757	-02 17 27.05	29.9892504	29.8944780	2.28	7.9	1.9
12/26/2024	23 51 51.924	-02 17 10.56	30.0064737	29.8944517	2.28	7.9	1.9
12/27/2024	23 51 54.220	-02 16 53.25	30.0236590	29.8944254	2.27	7.9	1.9
12/28/2024	23 51 56.644	-02 16 35.11	30.0408008	29.8943991	2.27	7.9	1.9
12/29/2024	23 51 59.196	-02 16 16.15	30.0578937	29.8943728	2.27	7.9	1.8
12/30/2024	23 52 01.873	-02 15 56.39	30.0749323	29.8943464	2.27	7.9	1.8
12/31/2024	23 52 04.675	-02 15 35.83	30.0919109	29.8943201	2.27	7.9	1.8
01/01/2025	23 52 07.600	-02 15 14.49	30.1088242	29.8942938	2.27	7.9	1.8



## 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					
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
01/03/2024	20	08	48.733	-22	58	44.02	35.8603225	34.9240787	0.09	14.5	0.5
01/04/2024	20	08	56.769	-22	58	23.61	35.8660395	34.9247539	0.09	14.5	0.5
01/05/2024	20	09	04.840	-22	58	03.13	35.8714743	34.9254292	0.09	14.5	0.4
01/06/2024	20	09	12.945	-22	57	42.58	35.8766251	34.9261045	0.09	14.5	0.4
01/07/2024	20	09	21.083	-22	57	21.99	35.8814903	34.9267798	0.09	14.5	0.4
01/08/2024	20	09	29.254	-22	57	01.35	35.8860684	34.9274552	0.09	14.5	0.3
01/09/2024	20	09	37.455	-22	56	40.69	35.8903581	34.9281305	0.09	14.5	0.3
01/10/2024	20	09	45.684	-22	56	20.02	35.8943578	34.9288059	0.09	14.5	0.3
01/11/2024	20	09	53.936	-22	55	59.35	35.8980665	34.9294813	0.09	14.5	0.3
01/12/2024	20	10	02.207	-22	55	38.72	35.9014831	34.9301567	0.09	14.5	0.2
01/13/2024	20	10	10.492	-22	55	18.11	35.9046067	34.9308322	0.09	14.5	0.2
01/14/2024	20	10	18.788	-22	54	57.54	35.9074367	34.9315076	0.09	14.5	0.2
01/15/2024	20	10	27.093	-22	54	36.98	35.9099727	34.9321831	0.09	14.5	0.2
01/16/2024	20	10	35.405	-22	54	16.44	35.9122145	34.9328586	0.09	14.5	0.1
01/17/2024	20	10	43.725	-22	53	55.90	35.9141621	34.9335341	0.09	14.5	0.1
01/18/2024	20	10	52.053	-22	53	35.37	35.9158155	34.9342097	0.09	14.5	0.1
01/19/2024	20	11	00.390	-22	53	14.86	35.9171751	34.9348852	0.09	14.5	0.1
01/20/2024	20	11	08.733	-22	52	54.38	35.9182409	34.9355608	0.09	14.5	0.1
01/21/2024	20	11	17.081	-22	52	33.95	35.9190135	34.9362364	0.09	14.5	0.1
01/22/2024	20	11	25.431	-22	52	13.59	35.9194930	34.9369120	0.09	14.5	0.1
01/23/2024	20	11	33.780	-22	51	53.31	35.9196800	34.9375876	0.09	14.5	0.1
01/24/2024	20	11	42.124	-22	51	33.12	35.9195747	34.9382633	0.09	14.5	0.1
01/25/2024	20	11	50.460	-22	51	13.03	35.9191777	34.9389390	0.09	14.5	0.2
01/26/2024	20	11	58.786	-22	50	53.04	35.9184893	34.9396146	0.09	14.5	0.2
01/27/2024	20	12	07.098	-22	50	33.16	35.9175099	34.9402904	0.09	14.5	0.2
01/28/2024	20	12	15.395	-22	50	13.38	35.9162402	34.9409661	0.09	14.5	0.2
01/29/2024	20	12	23.676	-22	49	53.70	35.9146805	34.9416418	0.09	14.5	0.3
01/30/2024	20	12	31.939	-22	49	34.12	35.9128314	34.9423176	0.09	14.5	0.3
01/31/2024	20	12	40.184	-22	49	14.64	35.9106936	34.9429934	0.09	14.5	0.3
02/01/2024	20	12	48.410	-22	48	55.26	35.9082676	34.9436692	0.09	14.5	0.3
02/02/2024	20	12	56.616	-22	48	35.99	35.9055542	34.9443450	0.09	14.5	0.4
02/03/2024	20	13	04.801	-22	48	16.83	35.9025542	34.9450208	0.09	14.5	0.4
02/04/2024	20	13	12.965	-22	47	57.79	35.8992684	34.9456967	0.09	14.5	0.4
02/05/2024	20	13	21.106	-22	47	38.88	35.8956976	34.9463725	0.09	14.5	0.4
02/06/2024	20	13	29.221	-22	47	20.13	35.8918430	34.9470484	0.09	14.5	0.5
02/07/2024	20	13	37.308	-22	47	01.55	35.8877056	34.9477243	0.09	14.5	0.5
02/08/2024	20	13	45.361	-22	46	43.15	35.8832866	34.9484003	0.09	14.5	0.5
02/09/2024	20	13	53.378	-22	46	24.95	35.8785875	34.9490762	0.09	14.5	0.5
02/10/2024	20	14	01.352	-22	46	06.95	35.8736098	34.9497522	0.09	14.5	0.6
02/11/2024	20	14	09.282	-22	45	49.14	35.8683554	34.9504282	0.09	14.5	0.6
02/12/2024	20	14	17.166	-22	45	31.52	35.8628264	34.9511042	0.09	14.5	0.6
02/13/2024	20	14	25.005	-22	45	14.07	35.8570250	34.9517802	0.09	14.5	0.7
02/14/2024	20	14	32.798	-22	44	56.78	35.8509535	34.9524562	0.09	14.5	0.7
02/15/2024	20	14	40.547	-22	44	39.68	35.8446145	34.9531323	0.09	14.5	0.7
02/16/2024	20	14	48.251	-22	44	22.76	35.8380106	34.9538084	0.09	14.5	0.7
02/17/2024	20	14	55.909	-22	44	06.06	35.8311444	34.9544844	0.09	14.5	0.8
02/18/2024	20	15	03.517	-22	43	49.58	35.8240184	34.9551606	0.09	14.5	0.8

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		
02/19/2024	20	15	11.072	-22	43	33.34	35.8166354	34.9558367	0.09	14.5	0.8
02/20/2024	20	15	18.572	-22	43	17.35	35.8089979	34.9565128	0.09	14.5	0.8
02/21/2024	20	15	26.013	-22	43	01.62	35.8011085	34.9571890	0.09	14.5	0.8
02/22/2024	20	15	33.394	-22	42	46.15	35.7929699	34.9578652	0.09	14.5	0.9
02/23/2024	20	15	40.711	-22	42	30.95	35.7845848	34.9585414	0.09	14.5	0.9
02/24/2024	20	15	47.962	-22	42	16.00	35.7759557	34.9592176	0.09	14.5	0.9
02/25/2024	20	15	55.148	-22	42	01.31	35.7670854	34.9598938	0.09	14.5	0.9
02/26/2024	20	16	02.266	-22	41	46.88	35.7579765	34.9605701	0.09	14.5	1.0
02/27/2024	20	16	09.316	-22	41	32.71	35.7486318	34.9612463	0.09	14.5	1.0
02/28/2024	20	16	16.299	-22	41	18.78	35.7390539	34.9619226	0.09	14.5	1.0
02/29/2024	20	16	23.212	-22	41	05.12	35.7292458	34.9625989	0.09	14.5	1.0
03/01/2024	20	16	30.057	-22	40	51.71	35.7192101	34.9632753	0.09	14.5	1.0
03/02/2024	20	16	36.833	-22	40	38.58	35.7089498	34.9639516	0.09	14.5	1.1
03/03/2024	20	16	43.537	-22	40	25.72	35.6984677	34.9646279	0.09	14.5	1.1
03/04/2024	20	16	50.169	-22	40	13.16	35.6877670	34.9653043	0.09	14.5	1.1
03/05/2024	20	16	56.727	-22	40	00.91	35.6768507	34.9659807	0.09	14.5	1.1
03/06/2024	20	17	03.206	-22	39	48.98	35.6657219	34.9666571	0.09	14.5	1.2
03/07/2024	20	17	09.604	-22	39	37.39	35.6543839	34.9673336	0.09	14.5	1.2
03/08/2024	20	17	15.916	-22	39	26.14	35.6428402	34.9680100	0.09	14.5	1.2
03/09/2024	20	17	22.140	-22	39	15.22	35.6310944	34.9686865	0.09	14.5	1.2
03/10/2024	20	17	28.273	-22	39	04.64	35.6191503	34.9693629	0.09	14.5	1.2
03/11/2024	20	17	34.316	-22	38	54.36	35.6070118	34.9700394	0.09	14.5	1.3
03/12/2024	20	17	40.269	-22	38	44.39	35.5946832	34.9707159	0.09	14.5	1.3
03/13/2024	20	17	46.134	-22	38	34.73	35.5821688	34.9713925	0.09	14.5	1.3
03/14/2024	20	17	51.912	-22	38	25.37	35.5694729	34.9720690	0.09	14.5	1.3
03/15/2024	20	17	57.602	-22	38	16.35	35.5565999	34.9727456	0.09	14.5	1.3
03/16/2024	20	18	03.202	-22	38	07.68	35.5435541	34.9734222	0.09	14.5	1.3
03/17/2024	20	18	08.709	-22	37	59.37	35.5303399	34.9740988	0.09	14.5	1.4
03/18/2024	20	18	14.121	-22	37	51.43	35.5169615	34.9747754	0.09	14.5	1.4
03/19/2024	20	18	19.434	-22	37	43.87	35.5034233	34.9754520	0.09	14.5	1.4
03/20/2024	20	18	24.648	-22	37	36.70	35.4897294	34.9761287	0.09	14.5	1.4
03/21/2024	20	18	29.760	-22	37	29.90	35.4758841	34.9768054	0.09	14.5	1.4
03/22/2024	20	18	34.768	-22	37	23.47	35.4618916	34.9774821	0.09	14.5	1.4
03/23/2024	20	18	39.673	-22	37	17.42	35.4477559	34.9781588	0.09	14.5	1.4
03/24/2024	20	18	44.474	-22	37	11.73	35.4334814	34.9788355	0.09	14.5	1.5
03/25/2024	20	18	49.171	-22	37	06.41	35.4190721	34.9795122	0.09	14.5	1.5
03/26/2024	20	18	53.764	-22	37	01.44	35.4045321	34.9801890	0.09	14.5	1.5
03/27/2024	20	18	58.253	-22	36	56.83	35.3898658	34.9808658	0.09	14.5	1.5
03/28/2024	20	19	02.639	-22	36	52.58	35.3750772	34.9815426	0.09	14.5	1.5
03/29/2024	20	19	06.921	-22	36	48.70	35.3601705	34.9822194	0.09	14.5	1.5
03/30/2024	20	19	11.100	-22	36	45.19	35.3451499	34.9828962	0.09	14.5	1.5
03/31/2024	20	19	15.174	-22	36	42.06	35.3300197	34.9835731	0.09	14.5	1.5
04/01/2024	20	19	19.142	-22	36	39.32	35.3147842	34.9842500	0.09	14.5	1.5
04/02/2024	20	19	23.002	-22	36	36.99	35.2994477	34.9849268	0.09	14.5	1.6
04/03/2024	20	19	26.750	-22	36	35.08	35.2840146	34.9856038	0.09	14.5	1.6
04/04/2024	20	19	30.384	-22	36	33.58	35.2684896	34.9862807	0.09	14.5	1.6
04/05/2024	20	19	33.902	-22	36	32.50	35.2528772	34.9869576	0.09	14.5	1.6
04/06/2024	20	19	37.302	-22	36	31.83	35.2371823	34.9876346	0.09	14.5	1.6
04/07/2024	20	19	40.583	-22	36	31.55	35.2214097	34.9883115	0.09	14.5	1.6
04/08/2024	20	19	43.747	-22	36	31.65	35.2055646	34.9889885	0.09	14.5	1.6

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		
04/09/2024	20 19 46.796	-22 36 32.12	35.1896521	34.9896655	0.09	14.5	1.6
04/10/2024	20 19 49.732	-22 36 32.97	35.1736776	34.9903426	0.09	14.5	1.6
04/11/2024	20 19 52.556	-22 36 34.19	35.1576463	34.9910196	0.09	14.5	1.6
04/12/2024	20 19 55.267	-22 36 35.81	35.1415635	34.9916967	0.09	14.5	1.6
04/13/2024	20 19 57.863	-22 36 37.85	35.1254344	34.9923738	0.09	14.5	1.6
04/14/2024	20 20 00.342	-22 36 40.31	35.1092641	34.9930508	0.09	14.5	1.6
04/15/2024	20 20 02.703	-22 36 43.19	35.0930577	34.9937280	0.09	14.5	1.6
04/16/2024	20 20 04.942	-22 36 46.51	35.0768202	34.9944051	0.09	14.5	1.6
04/17/2024	20 20 07.060	-22 36 50.24	35.0605563	34.9950822	0.09	14.5	1.7
04/18/2024	20 20 09.056	-22 36 54.39	35.0442711	34.9957594	0.09	14.5	1.7
04/19/2024	20 20 10.930	-22 36 58.95	35.0279692	34.9964366	0.09	14.5	1.7
04/20/2024	20 20 12.682	-22 37 03.90	35.0116554	34.9971138	0.09	14.5	1.7
04/21/2024	20 20 14.313	-22 37 09.25	34.9953345	34.9977910	0.09	14.5	1.7
04/22/2024	20 20 15.825	-22 37 14.98	34.9790110	34.9984682	0.09	14.5	1.7
04/23/2024	20 20 17.217	-22 37 21.09	34.9626897	34.9991455	0.09	14.5	1.7
04/24/2024	20 20 18.492	-22 37 27.57	34.9463751	34.9998228	0.09	14.5	1.7
04/25/2024	20 20 19.650	-22 37 34.44	34.9300719	35.0005000	0.09	14.5	1.7
04/26/2024	20 20 20.693	-22 37 41.69	34.9137845	35.0011773	0.09	14.5	1.7
04/27/2024	20 20 21.619	-22 37 49.32	34.8975175	35.0018547	0.09	14.5	1.7
04/28/2024	20 20 22.428	-22 37 57.35	34.8812755	35.0025320	0.09	14.5	1.6
04/29/2024	20 20 23.119	-22 38 05.78	34.8650632	35.0032093	0.09	14.5	1.6
04/30/2024	20 20 23.690	-22 38 14.63	34.8488851	35.0038867	0.09	14.5	1.6
05/01/2024	20 20 24.140	-22 38 23.88	34.8327459	35.0045641	0.09	14.5	1.6
05/02/2024	20 20 24.467	-22 38 33.55	34.8166506	35.0052415	0.09	14.5	1.6
05/03/2024	20 20 24.670	-22 38 43.61	34.8006038	35.0059189	0.09	14.5	1.6
05/04/2024	20 20 24.748	-22 38 54.05	34.7846106	35.0065964	0.09	14.5	1.6
05/05/2024	20 20 24.705	-22 39 04.86	34.7686760	35.0072738	0.09	14.5	1.6
05/06/2024	20 20 24.542	-22 39 16.02	34.7528052	35.0079513	0.09	14.5	1.6
05/07/2024	20 20 24.262	-22 39 27.52	34.7370034	35.0086288	0.09	14.5	1.6
05/08/2024	20 20 23.867	-22 39 39.37	34.7212758	35.0093063	0.09	14.5	1.6
05/09/2024	20 20 23.358	-22 39 51.57	34.7056276	35.0099838	0.09	14.5	1.6
05/10/2024	20 20 22.736	-22 40 04.14	34.6900638	35.0106614	0.09	14.5	1.6
05/11/2024	20 20 21.999	-22 40 17.09	34.6745895	35.0113389	0.09	14.5	1.6
05/12/2024	20 20 21.145	-22 40 30.42	34.6592096	35.0120165	0.09	14.5	1.6
05/13/2024	20 20 20.173	-22 40 44.13	34.6439289	35.0126941	0.09	14.5	1.6
05/14/2024	20 20 19.083	-22 40 58.22	34.6287519	35.0133717	0.09	14.5	1.6
05/15/2024	20 20 17.875	-22 41 12.67	34.6136833	35.0140493	0.09	14.5	1.5
05/16/2024	20 20 16.550	-22 41 27.46	34.5987274	35.0147270	0.09	14.5	1.5
05/17/2024	20 20 15.109	-22 41 42.60	34.5838887	35.0154047	0.09	14.5	1.5
05/18/2024	20 20 13.554	-22 41 58.06	34.5691715	35.0160823	0.09	14.5	1.5
05/19/2024	20 20 11.887	-22 42 13.84	34.5545799	35.0167600	0.09	14.5	1.5
05/20/2024	20 20 10.110	-22 42 29.93	34.5401182	35.0174378	0.09	14.5	1.5
05/21/2024	20 20 08.225	-22 42 46.31	34.5257903	35.0181155	0.09	14.5	1.5
05/22/2024	20 20 06.233	-22 43 02.99	34.5116004	35.0187932	0.09	14.5	1.5
05/23/2024	20 20 04.137	-22 43 19.97	34.4975523	35.0194710	0.09	14.5	1.4
05/24/2024	20 20 01.938	-22 43 37.25	34.4836501	35.0201488	0.10	14.5	1.4
05/25/2024	20 19 59.636	-22 43 54.83	34.4698975	35.0208266	0.10	14.5	1.4
05/26/2024	20 19 57.230	-22 44 12.72	34.4562986	35.0215044	0.10	14.5	1.4
05/27/2024	20 19 54.721	-22 44 30.92	34.4428572	35.0221823	0.10	14.5	1.4
05/28/2024	20 19 52.106	-22 44 49.43	34.4295771	35.0228601	0.10	14.5	1.4

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		
05/29/2024	20	19	49.386	-22	45	08.25	34.4164625	35.0235380	0.10	14.5	1.4
05/30/2024	20	19	46.560	-22	45	27.36	34.4035172	35.0242159	0.10	14.5	1.3
05/31/2024	20	19	43.629	-22	45	46.75	34.3907455	35.0248938	0.10	14.5	1.3
06/01/2024	20	19	40.595	-22	46	06.39	34.3781513	35.0255717	0.10	14.5	1.3
06/02/2024	20	19	37.462	-22	46	26.27	34.3657390	35.0262496	0.10	14.5	1.3
06/03/2024	20	19	34.232	-22	46	46.38	34.3535126	35.0269276	0.10	14.5	1.3
06/04/2024	20	19	30.910	-22	47	06.71	34.3414764	35.0276056	0.10	14.5	1.3
06/05/2024	20	19	27.497	-22	47	27.27	34.3296345	35.0282836	0.10	14.5	1.2
06/06/2024	20	19	23.995	-22	47	48.07	34.3179910	35.0289616	0.10	14.5	1.2
06/07/2024	20	19	20.404	-22	48	09.10	34.3065498	35.0296396	0.10	14.5	1.2
06/08/2024	20	19	16.723	-22	48	30.38	34.2953148	35.0303177	0.10	14.5	1.2
06/09/2024	20	19	12.952	-22	48	51.90	34.2842895	35.0309957	0.10	14.5	1.2
06/10/2024	20	19	09.091	-22	49	13.66	34.2734775	35.0316738	0.10	14.4	1.1
06/11/2024	20	19	05.140	-22	49	35.64	34.2628821	35.0323519	0.10	14.4	1.1
06/12/2024	20	19	01.102	-22	49	57.83	34.2525066	35.0330301	0.10	14.4	1.1
06/13/2024	20	18	56.978	-22	50	20.21	34.2423540	35.0337082	0.10	14.4	1.1
06/14/2024	20	18	52.771	-22	50	42.77	34.2324274	35.0343864	0.10	14.4	1.0
06/15/2024	20	18	48.483	-22	51	05.50	34.2227297	35.0350645	0.10	14.4	1.0
06/16/2024	20	18	44.118	-22	51	28.38	34.2132636	35.0357427	0.10	14.4	1.0
06/17/2024	20	18	39.677	-22	51	51.40	34.2040318	35.0364209	0.10	14.4	1.0
06/18/2024	20	18	35.165	-22	52	14.56	34.1950370	35.0370992	0.10	14.4	0.9
06/19/2024	20	18	30.583	-22	52	37.85	34.1862816	35.0377774	0.10	14.4	0.9
06/20/2024	20	18	25.934	-22	53	01.27	34.1777681	35.0384557	0.10	14.4	0.9
06/21/2024	20	18	21.220	-22	53	24.82	34.1694990	35.0391340	0.10	14.4	0.9
06/22/2024	20	18	16.441	-22	53	48.52	34.1614764	35.0398123	0.10	14.4	0.9
06/23/2024	20	18	11.596	-22	54	12.35	34.1537028	35.0404906	0.10	14.4	0.8
06/24/2024	20	18	06.687	-22	54	36.32	34.1461803	35.0411690	0.10	14.4	0.8
06/25/2024	20	18	01.712	-22	55	00.42	34.1389115	35.0418473	0.10	14.4	0.8
06/26/2024	20	17	56.671	-22	55	24.64	34.1318985	35.0425257	0.10	14.4	0.8
06/27/2024	20	17	51.567	-22	55	48.96	34.1251439	35.0432041	0.10	14.4	0.7
06/28/2024	20	17	46.402	-22	56	13.36	34.1186500	35.0438825	0.10	14.4	0.7
06/29/2024	20	17	41.179	-22	56	37.82	34.1124193	35.0445609	0.10	14.4	0.7
06/30/2024	20	17	35.904	-22	57	02.32	34.1064543	35.0452394	0.10	14.4	0.7
07/01/2024	20	17	30.579	-22	57	26.86	34.1007573	35.0459179	0.10	14.4	0.6
07/02/2024	20	17	25.209	-22	57	51.44	34.0953308	35.0465964	0.10	14.4	0.6
07/03/2024	20	17	19.794	-22	58	16.07	34.0901768	35.0472749	0.10	14.4	0.6
07/04/2024	20	17	14.337	-22	58	40.74	34.0852976	35.0479534	0.10	14.4	0.6
07/05/2024	20	17	08.838	-22	59	05.46	34.0806951	35.0486319	0.10	14.4	0.5
07/06/2024	20	17	03.297	-22	59	30.23	34.0763711	35.0493105	0.10	14.4	0.5
07/07/2024	20	16	57.714	-22	59	55.05	34.0723273	35.0499891	0.10	14.4	0.5
07/08/2024	20	16	52.091	-23	00	19.89	34.0685651	35.0506677	0.10	14.4	0.4
07/09/2024	20	16	46.430	-23	00	44.76	34.0650858	35.0513463	0.10	14.4	0.4
07/10/2024	20	16	40.732	-23	01	09.62	34.0618907	35.0520249	0.10	14.4	0.4
07/11/2024	20	16	35.001	-23	01	34.47	34.0589806	35.0527036	0.10	14.4	0.4
07/12/2024	20	16	29.240	-23	01	59.29	34.0563566	35.0533822	0.10	14.4	0.3
07/13/2024	20	16	23.452	-23	02	24.06	34.0540193	35.0540609	0.10	14.4	0.3
07/14/2024	20	16	17.640	-23	02	48.78	34.0519696	35.0547396	0.10	14.4	0.3
07/15/2024	20	16	11.809	-23	03	13.44	34.0502079	35.0554184	0.10	14.4	0.3
07/16/2024	20	16	05.961	-23	03	38.03	34.0487347	35.0560971	0.10	14.4	0.2
07/17/2024	20	16	00.099	-23	04	02.55	34.0475505	35.0567759	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		
07/18/2024	20 15 54.226	-23 04 27.00	34.0466554	35.0574546	0.10	14.4	0.2
07/19/2024	20 15 48.342	-23 04 51.38	34.0460497	35.0581334	0.10	14.4	0.2
07/20/2024	20 15 42.449	-23 05 15.70	34.0457335	35.0588122	0.10	14.4	0.1
07/21/2024	20 15 36.546	-23 05 39.96	34.0457070	35.0594911	0.10	14.4	0.1
07/22/2024	20 15 30.634	-23 06 04.15	34.0459704	35.0601699	0.10	14.4	0.1
07/23/2024	20 15 24.713	-23 06 28.26	34.0465237	35.0608488	0.10	14.4	0.1
07/24/2024	20 15 18.783	-23 06 52.28	34.0473671	35.0615277	0.10	14.4	0.1
07/25/2024	20 15 12.849	-23 07 16.18	34.0485010	35.0622066	0.10	14.4	0.1
07/26/2024	20 15 06.913	-23 07 39.94	34.0499255	35.0628855	0.10	14.4	0.1
07/27/2024	20 15 00.980	-23 08 03.54	34.0516409	35.0635644	0.10	14.4	0.1
07/28/2024	20 14 55.056	-23 08 26.99	34.0536474	35.0642434	0.10	14.4	0.2
07/29/2024	20 14 49.142	-23 08 50.28	34.0559452	35.0649224	0.10	14.4	0.2
07/30/2024	20 14 43.242	-23 09 13.41	34.0585341	35.0656013	0.10	14.4	0.2
07/31/2024	20 14 37.358	-23 09 36.39	34.0614141	35.0662803	0.10	14.4	0.2
08/01/2024	20 14 31.490	-23 09 59.22	34.0645850	35.0669594	0.10	14.4	0.3
08/02/2024	20 14 25.639	-23 10 21.91	34.0680462	35.0676384	0.10	14.4	0.3
08/03/2024	20 14 19.805	-23 10 44.45	34.0717972	35.0683175	0.10	14.4	0.3
08/04/2024	20 14 13.989	-23 11 06.83	34.0758371	35.0689965	0.10	14.4	0.3
08/05/2024	20 14 08.194	-23 11 29.03	34.0801652	35.0696756	0.10	14.4	0.4
08/06/2024	20 14 02.420	-23 11 51.05	34.0847801	35.0703548	0.10	14.4	0.4
08/07/2024	20 13 56.673	-23 12 12.87	34.0896808	35.0710339	0.10	14.4	0.4
08/08/2024	20 13 50.953	-23 12 34.47	34.0948659	35.0717130	0.10	14.4	0.4
08/09/2024	20 13 45.265	-23 12 55.84	34.1003338	35.0723922	0.10	14.4	0.5
08/10/2024	20 13 39.613	-23 13 16.98	34.1060829	35.0730714	0.10	14.4	0.5
08/11/2024	20 13 33.998	-23 13 37.87	34.1121116	35.0737506	0.10	14.4	0.5
08/12/2024	20 13 28.426	-23 13 58.51	34.1184181	35.0744298	0.10	14.4	0.5
08/13/2024	20 13 22.898	-23 14 18.90	34.1250004	35.0751090	0.10	14.4	0.6
08/14/2024	20 13 17.417	-23 14 39.04	34.1318566	35.0757883	0.10	14.4	0.6
08/15/2024	20 13 11.984	-23 14 58.93	34.1389847	35.0764675	0.10	14.4	0.6
08/16/2024	20 13 06.601	-23 15 18.57	34.1463824	35.0771468	0.10	14.4	0.6
08/17/2024	20 13 01.268	-23 15 37.98	34.1540477	35.0778261	0.10	14.4	0.7
08/18/2024	20 12 55.985	-23 15 57.15	34.1619783	35.0785054	0.10	14.4	0.7
08/19/2024	20 12 50.751	-23 16 16.08	34.1701722	35.0791848	0.10	14.4	0.7
08/20/2024	20 12 45.568	-23 16 34.75	34.1786271	35.0798641	0.10	14.4	0.7
08/21/2024	20 12 40.436	-23 16 53.14	34.1873411	35.0805435	0.10	14.4	0.8
08/22/2024	20 12 35.359	-23 17 11.24	34.1963122	35.0812229	0.10	14.4	0.8
08/23/2024	20 12 30.341	-23 17 29.02	34.2055382	35.0819023	0.10	14.4	0.8
08/24/2024	20 12 25.388	-23 17 46.48	34.2150173	35.0825817	0.10	14.4	0.8
08/25/2024	20 12 20.502	-23 18 03.62	34.2247474	35.0832611	0.10	14.4	0.9
08/26/2024	20 12 15.687	-23 18 20.44	34.2347263	35.0839406	0.10	14.5	0.9
08/27/2024	20 12 10.943	-23 18 36.97	34.2449517	35.0846200	0.10	14.5	0.9
08/28/2024	20 12 06.271	-23 18 53.20	34.2554211	35.0852995	0.10	14.5	0.9
08/29/2024	20 12 01.671	-23 19 09.13	34.2661320	35.0859790	0.10	14.5	1.0
08/30/2024	20 11 57.143	-23 19 24.77	34.2770816	35.0866585	0.10	14.5	1.0
08/31/2024	20 11 52.688	-23 19 40.11	34.2882670	35.0873381	0.10	14.5	1.0
09/01/2024	20 11 48.308	-23 19 55.14	34.2996851	35.0880176	0.10	14.5	1.0
09/02/2024	20 11 44.003	-23 20 09.84	34.3113327	35.0886972	0.10	14.5	1.1
09/03/2024	20 11 39.776	-23 20 24.22	34.3232065	35.0893768	0.10	14.5	1.1
09/04/2024	20 11 35.629	-23 20 38.25	34.3353031	35.0900564	0.10	14.5	1.1
09/05/2024	20 11 31.566	-23 20 51.92	34.3476190	35.0907360	0.10	14.5	1.1

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		
09/06/2024	20 11 27.589	-23 21 05.23	34.3601504	35.0914157	0.10	14.5	1.1
09/07/2024	20 11 23.702	-23 21 18.17	34.3728936	35.0920953	0.10	14.5	1.2
09/08/2024	20 11 19.905	-23 21 30.74	34.3858449	35.0927750	0.10	14.5	1.2
09/09/2024	20 11 16.203	-23 21 42.94	34.3990004	35.0934547	0.10	14.5	1.2
09/10/2024	20 11 12.596	-23 21 54.78	34.4123560	35.0941344	0.10	14.5	1.2
09/11/2024	20 11 09.087	-23 22 06.25	34.4259079	35.0948141	0.10	14.5	1.2
09/12/2024	20 11 05.675	-23 22 17.37	34.4396519	35.0954939	0.10	14.5	1.2
09/13/2024	20 11 02.361	-23 22 28.14	34.4535840	35.0961736	0.10	14.5	1.3
09/14/2024	20 10 59.145	-23 22 38.57	34.4677001	35.0968534	0.10	14.5	1.3
09/15/2024	20 10 56.025	-23 22 48.65	34.4819962	35.0975332	0.10	14.5	1.3
09/16/2024	20 10 53.001	-23 22 58.38	34.4964683	35.0982130	0.09	14.5	1.3
09/17/2024	20 10 50.073	-23 23 07.75	34.5111123	35.0988929	0.09	14.5	1.3
09/18/2024	20 10 47.243	-23 23 16.73	34.5259245	35.0995727	0.09	14.5	1.3
09/19/2024	20 10 44.515	-23 23 25.31	34.5409010	35.1002526	0.09	14.5	1.4
09/20/2024	20 10 41.892	-23 23 33.49	34.5560380	35.1009325	0.09	14.5	1.4
09/21/2024	20 10 39.378	-23 23 41.25	34.5713319	35.1016124	0.09	14.5	1.4
09/22/2024	20 10 36.975	-23 23 48.62	34.5867788	35.1022923	0.09	14.5	1.4
09/23/2024	20 10 34.685	-23 23 55.60	34.6023748	35.1029722	0.09	14.5	1.4
09/24/2024	20 10 32.506	-23 24 02.22	34.6181158	35.1036522	0.09	14.5	1.4
09/25/2024	20 10 30.438	-23 24 08.47	34.6339977	35.1043322	0.09	14.5	1.4
09/26/2024	20 10 28.480	-23 24 14.36	34.6500162	35.1050121	0.09	14.5	1.5
09/27/2024	20 10 26.631	-23 24 19.88	34.6661668	35.1056922	0.09	14.5	1.5
09/28/2024	20 10 24.893	-23 24 25.03	34.6824449	35.1063722	0.09	14.5	1.5
09/29/2024	20 10 23.265	-23 24 29.81	34.6988459	35.1070522	0.09	14.5	1.5
09/30/2024	20 10 21.749	-23 24 34.20	34.7153651	35.1077323	0.09	14.5	1.5
10/01/2024	20 10 20.347	-23 24 38.19	34.7319975	35.1084124	0.09	14.5	1.5
10/02/2024	20 10 19.060	-23 24 41.78	34.7487382	35.1090924	0.09	14.5	1.5
10/03/2024	20 10 17.891	-23 24 44.97	34.7655823	35.1097726	0.09	14.5	1.5
10/04/2024	20 10 16.840	-23 24 47.74	34.7825247	35.1104527	0.09	14.5	1.5
10/05/2024	20 10 15.911	-23 24 50.10	34.7995602	35.1111328	0.09	14.5	1.5
10/06/2024	20 10 15.104	-23 24 52.05	34.8166838	35.1118130	0.09	14.5	1.6
10/07/2024	20 10 14.421	-23 24 53.60	34.8338903	35.1124932	0.09	14.5	1.6
10/08/2024	20 10 13.861	-23 24 54.75	34.8511745	35.1131734	0.09	14.5	1.6
10/09/2024	20 10 13.425	-23 24 55.52	34.8685311	35.1138536	0.09	14.5	1.6
10/10/2024	20 10 13.112	-23 24 55.92	34.8859551	35.1145338	0.09	14.5	1.6
10/11/2024	20 10 12.921	-23 24 55.94	34.9034413	35.1152141	0.09	14.5	1.6
10/12/2024	20 10 12.850	-23 24 55.60	34.9209845	35.1158943	0.09	14.5	1.6
10/13/2024	20 10 12.898	-23 24 54.89	34.9385797	35.1165746	0.09	14.5	1.6
10/14/2024	20 10 13.064	-23 24 53.80	34.9562220	35.1172549	0.09	14.5	1.6
10/15/2024	20 10 13.348	-23 24 52.34	34.9739063	35.1179352	0.09	14.5	1.6
10/16/2024	20 10 13.751	-23 24 50.47	34.9916280	35.1186156	0.09	14.5	1.6
10/17/2024	20 10 14.276	-23 24 48.19	35.0093825	35.1192959	0.09	14.5	1.6
10/18/2024	20 10 14.927	-23 24 45.49	35.0271650	35.1199763	0.09	14.5	1.6
10/19/2024	20 10 15.705	-23 24 42.39	35.0449710	35.1206567	0.09	14.5	1.6
10/20/2024	20 10 16.611	-23 24 38.90	35.0627960	35.1213371	0.09	14.5	1.6
10/21/2024	20 10 17.643	-23 24 35.04	35.0806352	35.1220175	0.09	14.5	1.6
10/22/2024	20 10 18.800	-23 24 30.83	35.0984838	35.1226979	0.09	14.5	1.6
10/23/2024	20 10 20.079	-23 24 26.27	35.1163371	35.1233784	0.09	14.5	1.6
10/24/2024	20 10 21.480	-23 24 21.36	35.1341898	35.1240589	0.09	14.5	1.6
10/25/2024	20 10 23.000	-23 24 16.10	35.1520370	35.1247394	0.09	14.5	1.6

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		
10/26/2024	20 10 24.639	-23 24 10.49	35.1698735	35.1254199	0.09	14.5	1.6
10/27/2024	20 10 26.398	-23 24 04.52	35.1876941	35.1261004	0.09	14.5	1.6
10/28/2024	20 10 28.277	-23 23 58.17	35.2054935	35.1267810	0.09	14.5	1.6
10/29/2024	20 10 30.278	-23 23 51.45	35.2232663	35.1274615	0.09	14.5	1.6
10/30/2024	20 10 32.400	-23 23 44.36	35.2410074	35.1281421	0.09	14.5	1.6
10/31/2024	20 10 34.645	-23 23 36.89	35.2587112	35.1288227	0.09	14.5	1.6
11/01/2024	20 10 37.013	-23 23 29.05	35.2763725	35.1295033	0.09	14.5	1.6
11/02/2024	20 10 39.506	-23 23 20.83	35.2939859	35.1301840	0.09	14.5	1.6
11/03/2024	20 10 42.123	-23 23 12.25	35.3115461	35.1308646	0.09	14.5	1.6
11/04/2024	20 10 44.863	-23 23 03.32	35.3290476	35.1315453	0.09	14.5	1.6
11/05/2024	20 10 47.726	-23 22 54.05	35.3464854	35.1322260	0.09	14.5	1.6
11/06/2024	20 10 50.710	-23 22 44.46	35.3638540	35.1329067	0.09	14.5	1.6
11/07/2024	20 10 53.813	-23 22 34.54	35.3811483	35.1335874	0.09	14.5	1.5
11/08/2024	20 10 57.032	-23 22 24.30	35.3983633	35.1342681	0.09	14.5	1.5
11/09/2024	20 11 00.366	-23 22 13.76	35.4154939	35.1349489	0.09	14.5	1.5
11/10/2024	20 11 03.812	-23 22 02.91	35.4325353	35.1356297	0.09	14.5	1.5
11/11/2024	20 11 07.368	-23 21 51.73	35.4494826	35.1363105	0.09	14.5	1.5
11/12/2024	20 11 11.036	-23 21 40.23	35.4663313	35.1369913	0.09	14.5	1.5
11/13/2024	20 11 14.816	-23 21 28.39	35.4830768	35.1376721	0.09	14.5	1.5
11/14/2024	20 11 18.710	-23 21 16.20	35.4997148	35.1383530	0.09	14.5	1.5
11/15/2024	20 11 22.719	-23 21 03.67	35.5162410	35.1390339	0.09	14.5	1.5
11/16/2024	20 11 26.844	-23 20 50.82	35.5326512	35.1397148	0.09	14.5	1.5
11/17/2024	20 11 31.083	-23 20 37.67	35.5489410	35.1403957	0.09	14.5	1.4
11/18/2024	20 11 35.435	-23 20 24.23	35.5651063	35.1410766	0.09	14.5	1.4
11/19/2024	20 11 39.895	-23 20 10.53	35.5811428	35.1417575	0.09	14.5	1.4
11/20/2024	20 11 44.460	-23 19 56.56	35.5970459	35.1424385	0.09	14.5	1.4
11/21/2024	20 11 49.129	-23 19 42.34	35.6128112	35.1431195	0.09	14.5	1.4
11/22/2024	20 11 53.899	-23 19 27.85	35.6284342	35.1438005	0.09	14.5	1.4
11/23/2024	20 11 58.770	-23 19 13.08	35.6439104	35.1444815	0.09	14.5	1.4
11/24/2024	20 12 03.741	-23 18 58.05	35.6592351	35.1451626	0.09	14.5	1.4
11/25/2024	20 12 08.812	-23 18 42.73	35.6744038	35.1458436	0.09	14.5	1.3
11/26/2024	20 12 13.983	-23 18 27.14	35.6894119	35.1465247	0.09	14.5	1.3
11/27/2024	20 12 19.255	-23 18 11.26	35.7042550	35.1472058	0.09	14.5	1.3
11/28/2024	20 12 24.628	-23 17 55.11	35.7189285	35.1478869	0.09	14.5	1.3
11/29/2024	20 12 30.100	-23 17 38.69	35.7334280	35.1485681	0.09	14.5	1.3
11/30/2024	20 12 35.672	-23 17 22.01	35.7477490	35.1492492	0.09	14.5	1.3
12/01/2024	20 12 41.342	-23 17 05.08	35.7618872	35.1499304	0.09	14.5	1.2
12/02/2024	20 12 47.108	-23 16 47.92	35.7758383	35.1506116	0.09	14.5	1.2
12/03/2024	20 12 52.969	-23 16 30.53	35.7895982	35.1512928	0.09	14.6	1.2
12/04/2024	20 12 58.920	-23 16 12.93	35.8031626	35.1519741	0.09	14.6	1.2
12/05/2024	20 13 04.960	-23 15 55.14	35.8165276	35.1526553	0.09	14.6	1.2
12/06/2024	20 13 11.084	-23 15 37.15	35.8296894	35.1533366	0.09	14.6	1.1
12/07/2024	20 13 17.291	-23 15 18.96	35.8426443	35.1540179	0.09	14.6	1.1
12/08/2024	20 13 23.577	-23 15 00.58	35.8553887	35.1546993	0.09	14.6	1.1
12/09/2024	20 13 29.943	-23 14 41.99	35.8679192	35.1553806	0.09	14.6	1.1
12/10/2024	20 13 36.387	-23 14 23.18	35.8802326	35.1560620	0.09	14.6	1.1
12/11/2024	20 13 42.911	-23 14 04.17	35.8923259	35.1567433	0.09	14.6	1.0
12/12/2024	20 13 49.516	-23 13 44.94	35.9041960	35.1574248	0.09	14.6	1.0
12/13/2024	20 13 56.201	-23 13 25.51	35.9158401	35.1581062	0.09	14.6	1.0
12/14/2024	20 14 02.965	-23 13 05.90	35.9272554	35.1587876	0.09	14.6	1.0

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		
12/15/2024	20	14	09.806	-23	12	46.12	35.9384392	35.1594691	0.09	14.6	1.0
12/16/2024	20	14	16.720	-23	12	26.21	35.9493886	35.1601506	0.09	14.6	0.9
12/17/2024	20	14	23.702	-23	12	06.17	35.9601010	35.1608321	0.09	14.6	0.9
12/18/2024	20	14	30.751	-23	11	46.01	35.9705733	35.1615136	0.09	14.6	0.9
12/19/2024	20	14	37.862	-23	11	25.72	35.9808029	35.1621952	0.09	14.6	0.9
12/20/2024	20	14	45.033	-23	11	05.30	35.9907867	35.1628768	0.09	14.6	0.8
12/21/2024	20	14	52.265	-23	10	44.76	36.0005220	35.1635584	0.09	14.6	0.8
12/22/2024	20	14	59.556	-23	10	24.08	36.0100058	35.1642400	0.09	14.6	0.8
12/23/2024	20	15	06.905	-23	10	03.26	36.0192354	35.1649216	0.09	14.6	0.8
12/24/2024	20	15	14.313	-23	09	42.31	36.0282079	35.1656033	0.09	14.6	0.8
12/25/2024	20	15	21.778	-23	09	21.23	36.0369207	35.1662850	0.09	14.6	0.7
12/26/2024	20	15	29.300	-23	09	00.02	36.0453712	35.1669667	0.09	14.6	0.7
12/27/2024	20	15	36.878	-23	08	38.70	36.0535568	35.1676484	0.09	14.6	0.7
12/28/2024	20	15	44.511	-23	08	17.28	36.0614750	35.1683302	0.09	14.6	0.7
12/29/2024	20	15	52.195	-23	07	55.77	36.0691234	35.1690119	0.09	14.6	0.6
12/30/2024	20	15	59.930	-23	07	34.19	36.0764997	35.1696937	0.09	14.6	0.6
12/31/2024	20	16	07.710	-23	07	12.55	36.0836017	35.1703755	0.09	14.6	0.6
01/01/2025	20	16	15.534	-23	06	50.86	36.0904274	35.1710574	0.09	14.6	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