

**Пояснение для эфемерид больших планет.** В эфемеридах планет приводятся: Date (год, месяц, день), Right Asc. – прямое восхождение, Declination – склонение, Distance - геоцентрическое расстояние от Земли до планеты в астрономических единицах, dia – видимый диаметр в секундах дуги, mag - звездная величина, Elong – видимое угловое удаление (элонгация) от Солнца в градусах, I - фазовый угол (угол при центре планеты между направлениями на Солнце и Землю), Фаза - величина освещенной части диска планеты (от 0 до 100%), Limb - позиционный угол средней точки светлого лимба в градусах (отсчитывается от точки севера против часовой стрелки от 0° до 360°), De - угол наклона оси планеты к картинной плоскости перпендикулярной лучу зрения в градусах, причем знак указывает наклон северного «+» или южного «-» полюса планеты к Земле (для Сатурна это также наклон колец), Pr – позиционный угол северного полюса планеты по отношению к полюсу мира в градусах (отсчитывается при центре планеты против часовой стрелки от 0° до 360°). (*Occult v4.0*)

Sun

Equinox of J2000

year	Date	Right Asc.	Declination	Distance	dia	Po	Bo	Lo	Carrington					
year	mth	d	h	m	s	o	'	"	AU	"	o	o	o	Rotation #
2021	Jan	1	18	45	40.13	-23	1	17.3	0.983265	1951.9	1.95	-3.03	280.37	2239
2021	Jan	6	19	7	40.17	-22	31	31.9	0.983292	1951.9	359.53	-3.60	214.52	2239
2021	Jan	11	19	29	29.36	-21	50	39.6	0.983449	1951.6	357.13	-4.15	148.68	2239
2021	Jan	16	19	51	4.29	-20	59	9.2	0.983704	1951.1	354.78	-4.66	82.84	2239
2021	Jan	21	20	12	21.93	-19	57	37.6	0.984057	1950.4	352.49	-5.13	17.00	2239
2021	Jan	26	20	33	20.27	-18	46	47.9	0.984533	1949.4	350.28	-5.57	311.17	2240
2021	Jan	31	20	53	58.44	-17	27	26.5	0.985152	1948.2	348.17	-5.96	245.34	2240
2021	Feb	5	21	14	16.48	-16	0	21.0	0.985913	1946.7	346.17	-6.30	179.51	2240
2021	Feb	10	21	34	14.83	-14	26	20.5	0.986778	1945.0	344.30	-6.59	113.67	2240
2021	Feb	15	21	53	53.95	-12	46	17.1	0.987713	1943.1	342.55	-6.83	47.84	2240
2021	Feb	20	22	13	14.65	-11	1	5.0	0.988717	1941.2	340.95	-7.02	342.00	2241
2021	Feb	25	22	32	18.45	-9	11	37.3	0.989806	1939.0	339.50	-7.15	276.15	2241
2021	Mar	2	22	51	7.52	-7	18	44.9	0.990999	1936.7	338.20	-7.23	210.29	2241
2021	Mar	7	23	9	44.52	-5	23	14.6	0.992286	1934.2	337.06	-7.25	144.41	2241
2021	Mar	12	23	28	11.96	-3	25	53.6	0.993623	1931.6	336.07	-7.22	78.53	2241
2021	Mar	17	23	46	32.00	-1	27	30.9	0.994977	1928.9	335.26	-7.13	12.63	2241
2021	Mar	22	0	4	46.81	0	31	4.4	0.996344	1926.3	334.62	-6.99	306.72	2242
2021	Mar	27	0	22	58.83	2	29	5.1	0.997740	1923.6	334.15	-6.79	240.78	2242
2021	Apr	1	0	41	10.80	4	25	47.6	0.999181	1920.8	333.85	-6.55	174.83	2242
2021	Apr	6	0	59	25.64	6	20	31.6	1.000650	1918.0	333.74	-6.25	108.86	2242
2021	Apr	11	1	17	45.75	8	12	34.9	1.002103	1915.2	333.81	-5.91	42.87	2242
2021	Apr	16	1	36	13.00	10	1	12.7	1.003510	1912.5	334.06	-5.53	336.86	2243
2021	Apr	21	1	54	49.05	11	45	40.3	1.004867	1910.0	334.49	-5.11	270.82	2243
2021	Apr	26	2	13	35.49	13	25	15.0	1.006193	1907.4	335.11	-4.66	204.77	2243
2021	May	1	2	32	34.03	14	59	17.5	1.007505	1905.0	335.91	-4.17	138.70	2243
2021	May	6	2	51	46.26	16	27	10.8	1.008781	1902.6	336.89	-3.66	72.61	2243
2021	May	11	3	11	12.88	17	48	16.1	1.009979	1900.3	338.04	-3.12	6.50	2243
2021	May	16	3	30	53.84	19	1	54.1	1.011076	1898.2	339.37	-2.55	300.38	2244
2021	May	21	3	50	48.57	20	7	27.6	1.012070	1896.4	340.86	-1.98	234.24	2244
2021	May	26	4	10	56.19	21	4	23.5	1.012985	1894.7	342.49	-1.39	168.09	2244
2021	May	31	4	31	15.86	21	52	14.6	1.013842	1893.1	344.27	-0.79	101.93	2244
2021	Jun	5	4	51	46.34	22	30	37.2	1.014614	1891.6	346.17	-0.19	35.76	2244
2021	Jun	10	5	12	25.48	22	59	10.1	1.015266	1890.4	348.18	0.42	329.59	2245
2021	Jun	15	5	33	10.42	23	17	36.5	1.015779	1889.4	350.28	1.02	263.41	2245
2021	Jun	20	5	53	57.99	23	25	46.0	1.016160	1888.7	352.46	1.61	197.22	2245
2021	Jun	25	6	14	45.16	23	23	35.5	1.016440	1888.2	354.68	2.19	131.04	2245
2021	Jun	30	6	35	29.49	23	11	8.7	1.016637	1887.9	356.94	2.76	64.85	2245
2021	Jul	5	6	56	8.55	22	48	33.8	1.016727	1887.7	359.20	3.30	358.67	2246
2021	Jul	10	7	16	39.66	22	16	4.1	1.016681	1887.8	1.46	3.83	292.50	2246
2021	Jul	15	7	37	0.18	21	33	58.7	1.016486	1888.1	3.69	4.33	226.33	2246
2021	Jul	20	7	57	7.84	20	42	42.8	1.016157	1888.7	5.88	4.80	160.17	2246
2021	Jul	25	8	17	1.26	19	42	45.5	1.015732	1889.5	8.01	5.23	94.02	2246
2021	Jul	30	8	36	40.05	18	34	37.8	1.015227	1890.5	10.07	5.63	27.88	2246
2021	Aug	4	8	56	4.15	17	18	52.3	1.014622	1891.6	12.05	5.99	321.76	2247
2021	Aug	9	9	15	13.51	15	56	4.4	1.013894	1893.0	13.92	6.31	255.64	2247
2021	Aug	14	9	34	8.31	14	26	52.5	1.013034	1894.6	15.70	6.59	189.54	2247
2021	Aug	19	9	52	49.09	12	51	57.5	1.012068	1896.4	17.36	6.82	123.45	2247
2021	Aug	24	10	11	17.30	11	11	59.3	1.011038	1898.3	18.89	7.00	57.38	2247
2021	Aug	29	10	29	35.00	9	27	35.5	1.009957	1900.3	20.30	7.14	351.32	2248
2021	Sep	3	10	47	44.29	7	39	23.9	1.008810	1902.5	21.58	7.22	285.27	2248
2021	Sep	8	11	5	47.15	5	48	4.4	1.007578	1904.8	22.72	7.25	219.23	2248
2021	Sep	13	11	23	45.44	3	54	20.0	1.006257	1907.3	23.70	7.23	153.21	2248
2021	Sep	18	11	41	41.23	1	58	54.5	1.004883	1909.9	24.54	7.16	87.20	2248
2021	Sep	23	11	59	37.20	0	2	28.6	1.003496	1912.6	25.22	7.03	21.20	2248
2021	Sep	28	12	17	36.28	-1	54	18.1	1.002109	1915.2	25.73	6.85	315.21	2249

2021 Oct 3	12 35 41.23	- 3 50 44.8	1.000711	1917.9	26.08	6.62	249.23	2249
2021 Oct 8	12 53 54.49	- 5 46 7.2	0.999283	1920.6	26.24	6.35	183.26	2249
2021 Oct 13	13 12 18.12	- 7 39 36.9	0.997826	1923.4	26.23	6.02	117.30	2249
2021 Oct 18	13 30 54.22	- 9 30 25.3	0.996381	1926.2	26.03	5.65	51.34	2249
2021 Oct 23	13 49 45.23	-11 17 46.1	0.994987	1928.9	25.64	5.23	345.40	2250
2021 Oct 28	14 8 53.49	-13 0 53.2	0.993655	1931.5	25.06	4.78	279.46	2250
2021 Nov 2	14 28 20.90	-14 38 58.4	0.992373	1934.0	24.28	4.28	213.52	2250
2021 Nov 7	14 48 8.65	-16 11 10.3	0.991120	1936.5	23.31	3.75	147.60	2250
2021 Nov 12	15 8 17.07	-17 36 35.1	0.989902	1938.8	22.14	3.20	81.68	2250
2021 Nov 17	15 28 46.23	-18 54 21.7	0.988761	1941.1	20.78	2.62	15.76	2250
2021 Nov 22	15 49 36.04	-20 3 43.2	0.987730	1943.1	19.23	2.01	309.85	2251
2021 Nov 27	16 10 45.89	-21 3 55.7	0.986815	1944.9	17.52	1.39	243.95	2251
2021 Dec 2	16 32 14.32	-21 54 17.6	0.986003	1946.5	15.64	0.76	178.05	2251
2021 Dec 7	16 53 58.76	-22 34 10.0	0.985266	1948.0	13.61	0.12	112.16	2251
2021 Dec 12	17 15 55.58	-23 3 0.3	0.984613	1949.3	11.46	-0.52	46.28	2251
2021 Dec 17	17 38 1.00	-23 20 25.1	0.984083	1950.3	9.21	-1.16	340.41	2252
2021 Dec 22	18 0 11.30	-23 26 10.9	0.983699	1951.1	6.88	-1.79	274.54	2252
2021 Dec 27	18 22 22.68	-23 20 12.2	0.983464	1951.5	4.49	-2.40	208.67	2252

Mercury  
Equinox of J2000

Date	Right Asc.	Declination	Distance	dia	mag	Elong	I	%Ill	Limb	De	Pp
year mth d	h m s	o ' "	AU	"		o	o		o	o	o
2021 Jan 1	19 16 45.71	-24 23 11.1	1.389626	4.8	-1.0	7.2e	17	97.9	279.3	-4	356
2021 Jan 4	19 37 59.98	-23 42 6.6	1.360418	4.9	-0.9	9.0e	22	96.5	274.1	-4	354
2021 Jan 7	19 59 2.42	-22 47 1.7	1.324373	5.0	-0.9	10.8e	27	94.4	269.7	-4	351
2021 Jan 10	20 19 42.11	-21 38 9.3	1.280872	5.2	-0.9	12.7e	34	91.5	265.8	-5	349
2021 Jan 13	20 39 43.51	-20 16 13.7	1.229298	5.4	-0.9	14.4e	42	87.4	262.3	-5	347
2021 Jan 16	20 58 44.00	-18 42 50.4	1.169196	5.7	-0.9	16.1e	51	81.8	259.0	-5	345
2021 Jan 19	21 16 10.56	-17 0 55.9	1.100551	6.1	-0.8	17.4e	61	74.1	256.0	-6	343
2021 Jan 22	21 31 16.15	-15 15 25.6	1.024252	6.5	-0.8	18.3e	74	64.0	253.2	-6	341
2021 Jan 25	21 42 57.66	-13 33 49.7	0.942670	7.1	-0.6	18.5e	88	51.5	250.4	-7	340
2021 Jan 28	21 50 0.19	-12 6 18.1	0.860160	7.8	-0.2	17.6e	105	37.2	247.4	-8	340
2021 Jan 31	21 51 14.22	-11 4 25.8	0.783023	8.5	0.7	15.3e	123	22.9	243.6	-9	339
2021 Feb 3	21 46 9.44	-10 37 59.6	0.718539	9.3	2.0	11.4e	142	10.7	237.3	-10	340
2021 Feb 6	21 35 35.40	-10 50 16.7	0.673099	9.9	4.0	6.4e	160	3.0	220.4	-10	341
2021 Feb 9	21 21 56.24	-11 34 49.0	0.650182	10.3	5.2	3.8w	169	0.9	147.7	-11	342
2021 Feb 12	21 8 27.36	-12 37 27.5	0.649326	10.3	3.6	8.3w	157	4.1	99.0	-11	343
2021 Feb 15	20 57 55.41	-13 43 4.6	0.666846	10.0	2.2	13.7w	141	10.9	87.7	-10	344
2021 Feb 18	20 51 47.59	-14 40 59.5	0.697685	9.6	1.3	18.2w	128	19.2	82.9	-10	345
2021 Feb 21	20 50 16.93	-15 25 47.4	0.737063	9.1	0.7	21.7w	117	27.7	79.9	-9	345
2021 Feb 24	20 52 54.49	-15 55 32.9	0.781252	8.6	0.4	24.1w	107	35.6	77.6	-9	345
2021 Feb 27	20 58 57.15	-16 10 2.3	0.827648	8.1	0.2	25.8w	98	42.7	75.6	-8	344
2021 Mar 2	21 7 42.68	-16 9 40.2	0.874547	7.6	0.1	26.8w	91	48.9	73.7	-7	344
2021 Mar 5	21 18 35.28	-15 55 2.3	0.920882	7.3	0.1	27.2w	85	54.3	71.9	-7	343
2021 Mar 8	21 31 6.54	-15 26 44.6	0.966012	6.9	0.0	27.2w	80	59.0	70.1	-6	341
2021 Mar 11	21 44 54.67	-14 45 20.7	1.009565	6.6	0.0	26.9w	75	63.3	68.4	-6	340
2021 Mar 14	21 59 43.42	-13 51 21.2	1.051338	6.4	0.0	26.2w	70	67.1	66.8	-5	339
2021 Mar 17	22 15 20.96	-12 45 13.7	1.091223	6.1	0.0	25.2w	66	70.5	65.2	-5	338
2021 Mar 20	22 31 39.07	-11 27 23.0	1.129146	5.9	-0.1	24.1w	62	73.8	63.8	-5	336
2021 Mar 23	22 48 32.43	- 9 58 12.5	1.165032	5.7	-0.2	22.7w	57	76.9	62.4	-4	335
2021 Mar 26	23 5 58.10	- 8 18 4.1	1.198764	5.6	-0.2	21.0w	53	79.9	61.2	-4	334
2021 Mar 29	23 23 55.21	- 6 27 19.8	1.230148	5.4	-0.3	19.2w	49	82.9	60.1	-4	333
2021 Apr 1	23 42 24.69	- 4 26 23.0	1.258870	5.3	-0.5	17.1w	44	85.9	59.0	-3	333
2021 Apr 4	0 1 28.96	- 2 15 41.4	1.284450	5.2	-0.6	14.9w	39	88.9	58.1	-3	332
2021 Apr 7	0 21 11.72	0 4 8.3	1.306190	5.1	-0.8	12.4w	33	91.9	57.3	-3	332
2021 Apr 10	0 41 37.49	2 32 14.2	1.323127	5.0	-1.1	9.7w	27	94.7	56.4	-3	331
2021 Apr 13	1 2 50.98	5 7 19.6	1.333979	5.0	-1.4	6.7w	19	97.2	55.0	-2	332
2021 Apr 16	1 24 55.82	7 47 28.8	1.337155	5.0	-1.8	3.6w	11	99.2	51.1	-2	332
2021 Apr 19	1 47 52.51	10 29 51.4	1.330850	5.0	-2.3	0.6e	2	100.0	347.6	-2	333
2021 Apr 22	2 11 35.68	13 10 29.7	1.313343	5.1	-2.0	3.4e	11	99.1	251.7	-2	334
2021 Apr 25	2 35 51.33	15 44 22.4	1.283499	5.2	-1.7	6.8e	23	96.1	248.1	-1	335
2021 Apr 28	3 0 15.91	18 5 57.5	1.241334	5.4	-1.4	10.2e	35	90.7	248.1	-1	337
2021 May 1	3 24 18.62	20 10 13.5	1.188314	5.6	-1.1	13.4e	48	83.3	249.3	-1	339
2021 May 4	3 47 26.52	21 53 38.9	1.127097	5.9	-0.9	16.1e	61	74.6	250.9	-1	341
2021 May 7	4 9 9.48	23 14 39.9	1.060869	6.3	-0.7	18.4e	72	65.4	252.7	0	343

2021 May 10	4	29	2.70	24	13	27.6	0.992656	6.7	-0.4	20.2e	83	56.4	254.6	0	345
2021 May 13	4	46	46.48	24	51	23.2	0.924953	7.2	-0.1	21.4e	92	47.8	256.5	1	346
2021 May 16	5	2	4.80	25	10	23.3	0.859650	7.8	0.2	22.0e	102	39.9	258.3	1	348
2021 May 19	5	14	43.86	25	12	35.7	0.798144	8.4	0.6	21.9e	110	32.6	260.1	1	350
2021 May 22	5	24	31.55	25	0	5.9	0.741510	9.0	1.0	21.2e	119	25.8	261.8	2	351
2021 May 25	5	31	18.05	24	34	52.1	0.690648	9.7	1.4	19.8e	127	19.6	263.5	3	351
2021 May 28	5	34	57.88	23	58	47.8	0.646396	10.3	2.0	17.7e	136	14.0	265.4	3	352
2021 May 31	5	35	33.19	23	13	50.5	0.609581	11.0	2.8	14.9e	145	9.1	267.9	4	352
2021 Jun 3	5	33	17.80	22	22	16.9	0.581024	11.5	3.6	11.5e	154	5.1	271.9	5	352
2021 Jun 6	5	28	40.74	21	27	0.4	0.561495	11.9	4.7	7.7e	163	2.2	280.3	6	351
2021 Jun 9	5	22	27.31	20	31	43.6	0.551620	12.1	5.8	4.1e	171	0.6	306.5	6	350
2021 Jun 12	5	15	35.59	19	40	50.1	0.551766	12.1	6.0	3.6w	172	0.5	18.8	7	350
2021 Jun 15	5	9	8.17	18	58	50.6	0.561968	11.9	4.9	7.1w	164	1.9	51.4	7	349
2021 Jun 18	5	4	2.37	18	29	31.8	0.581924	11.5	3.8	10.9w	155	4.6	61.4	8	348
2021 Jun 21	5	1	2.74	18	15	13.9	0.611062	10.9	2.9	14.3w	146	8.5	66.3	8	348
2021 Jun 24	5	0	38.63	18	16	33.6	0.648653	10.3	2.1	17.1w	137	13.3	69.5	8	348
2021 Jun 27	5	3	5.88	18	32	32.5	0.693895	9.6	1.5	19.3w	128	18.9	72.2	7	348
2021 Jun 30	5	8	30.78	19	1	0.1	0.745964	9.0	1.0	20.7w	120	25.2	74.6	7	349
2021 Jul 3	5	16	54.20	19	38	55.8	0.804012	8.3	0.6	21.4w	111	32.1	77.0	7	350
2021 Jul 6	5	28	14.73	20	22	44.3	0.867098	7.7	0.2	21.5w	102	39.6	79.6	7	351
2021 Jul 9	5	42	30.19	21	8	21.6	0.934074	7.2	-0.1	20.9w	92	47.9	82.4	6	353
2021 Jul 12	5	59	37.38	21	51	15.2	1.003420	6.7	-0.4	19.7w	82	56.7	85.5	6	355
2021 Jul 15	6	19	29.95	22	26	24.6	1.073079	6.2	-0.7	18.0w	71	66.0	89.1	6	357
2021 Jul 18	6	41	54.69	22	48	31.6	1.140371	5.9	-0.9	15.7w	59	75.4	93.2	6	360
2021 Jul 21	7	6	27.47	22	52	32.1	1.202128	5.6	-1.2	12.9w	47	84.1	97.9	6	3
2021 Jul 24	7	32	31.32	22	34	28.6	1.255162	5.3	-1.4	9.8w	34	91.3	103.8	5	6
2021 Jul 27	7	59	19.83	21	52	28.5	1.296990	5.2	-1.7	6.5w	22	96.4	112.3	5	9
2021 Jul 30	8	26	5.59	20	47	10.4	1.326435	5.0	-2.0	3.3w	11	99.1	131.1	5	12
2021 Aug 2	8	52	9.61	19	21	20.4	1.343741	5.0	-2.1	1.8e	5	99.8	210.9	5	15
2021 Aug 5	9	17	6.30	17	38	53.5	1.350170	4.9	-1.7	4.1e	12	98.9	262.3	5	17
2021 Aug 8	9	40	43.19	15	43	56.7	1.347437	5.0	-1.3	7.1e	20	97.0	275.0	5	20
2021 Aug 11	10	2	57.44	13	40	13.5	1.337257	5.0	-1.0	9.9e	27	94.5	281.1	5	21
2021 Aug 14	10	23	52.00	11	30	50.5	1.321112	5.1	-0.8	12.5e	33	91.8	285.0	5	23
2021 Aug 17	10	43	32.61	9	18	17.8	1.300174	5.1	-0.6	14.9e	39	88.9	287.8	5	25
2021 Aug 20	11	2	5.87	7	4	34.6	1.275321	5.2	-0.4	17.0e	44	86.0	290.0	6	26
2021 Aug 23	11	19	38.12	4	51	16.6	1.247182	5.4	-0.3	19.0e	49	83.1	291.7	6	27
2021 Aug 26	11	36	14.77	2	39	42.6	1.216184	5.5	-0.2	20.8e	53	80.2	293.1	6	27
2021 Aug 29	11	51	59.88	0	31	0.6	1.182607	5.6	-0.1	22.4e	57	77.2	294.2	6	28
2021 Sep 1	12	6	55.84	-1	33	46.6	1.146622	5.8	-0.1	23.7e	61	74.0	295.1	6	28
2021 Sep 4	12	21	3.13	-3	33	37.0	1.108334	6.0	0.0	24.9e	66	70.7	295.9	6	29
2021 Sep 7	12	34	19.86	-5	27	24.7	1.067814	6.3	0.0	25.8e	70	67.2	296.5	6	29
2021 Sep 10	12	46	41.27	-7	13	54.1	1.025141	6.5	0.0	26.4e	75	63.3	297.1	6	29
2021 Sep 13	12	57	59.02	-8	51	33.5	0.980444	6.8	0.1	26.7e	80	58.9	297.6	6	29
2021 Sep 16	13	8	0.27	-10	18	26.7	0.933965	7.2	0.1	26.7e	85	53.9	298.1	6	29
2021 Sep 19	13	16	26.59	-11	32	2.3	0.886136	7.5	0.2	26.2e	92	48.3	298.6	6	28
2021 Sep 22	13	22	52.96	-12	28	58.4	0.837698	8.0	0.3	25.1e	99	41.8	299.4	6	28
2021 Sep 25	13	26	47.43	-13	4	47.0	0.789873	8.5	0.5	23.3e	108	34.3	300.3	6	28
2021 Sep 28	13	27	33.27	-13	13	45.1	0.744599	9.0	0.9	20.7e	119	26.1	301.7	7	28
2021 Oct 1	13	24	36.83	-12	49	19.7	0.704820	9.5	1.5	17.0e	131	17.3	303.9	6	28
2021 Oct 4	13	17	45.37	-11	46	5.0	0.674682	9.9	2.6	12.1e	145	8.9	307.6	6	28
2021 Oct 7	13	7	34.77	-10	4	8.5	0.659340	10.1	4.3	6.4e	162	2.5	317.2	6	29
2021 Oct 10	12	55	52.34	-7	55	3.1	0.663939	10.1	6.0	1.9w	174	0.2	43.9	6	29
2021 Oct 13	12	45	23.43	-5	43	12.3	0.691711	9.7	3.7	7.0w	158	3.6	106.6	5	29
2021 Oct 16	12	38	50.72	-3	57	14.9	0.742155	9.0	1.8	12.1w	138	12.8	114.1	4	29
2021 Oct 19	12	37	48.29	-2	57	4.2	0.810736	8.2	0.5	15.7w	119	25.9	116.8	3	29
2021 Oct 22	12	42	22.41	-2	47	57.4	0.890379	7.5	-0.3	17.7w	101	40.7	118.1	3	29
2021 Oct 25	12	51	39.03	-3	23	53.2	0.973677	6.9	-0.6	18.4w	85	54.8	118.8	2	29
2021 Oct 28	13	4	23.32	-4	33	50.3	1.054631	6.3	-0.8	18.0w	70	66.8	119.0	2	28
2021 Oct 31	13	19	26.86	-6	6	29.6	1.129350	5.9	-0.8	17.0w	58	76.3	118.9	1	28
2021 Nov 3	13	35	58.46	-7	52	27.8	1.195870	5.6	-0.8	15.5w	48	83.5	118.5	1	28
2021 Nov 6	13	53	24.18	-9	44	45.9	1.253584	5.3	-0.9	13.8w	39	88.8	117.7	0	27
2021 Nov 9	14	11	23.47	-11	38	29.4	1.302660	5.1	-0.9	12.0w	32	92.6	116.6	0	26
2021 Nov 12	14	29	44.84	-13	30	16.7	1.343632	5.0	-0.9	10.1w	25	95.2	115.1	0	25
2021 Nov 15	14	48	22.48	-15	17	49.5	1.377144	4.9	-1.0	8.3w	20	97.1	113.1	0	24
2021 Nov 18	15	7	14.01	-16	59	30.8	1.403817	4.8	-1.0	6.5w	15	98.3	110.4	-1	23
2021 Nov 21	15	26	18.89	-18	34	9.1	1.424191	4.7	-1.1	4.7w	10	99.2	106.6	-1	21
2021 Nov 24	15	45	37.49	-20	0	48.9	1.438703	4.6	-1.2	2.9w	6	99.7	99.7	-1	20

2021	Nov	27	16	5	10.52	-21	18	43.6	1.447687	4.6	-1.3	1.3w	3	99.9	79.5	-1	18
2021	Nov	30	16	24	58.59	-22	27	11.8	1.451369	4.6	-1.4	0.9e	2	100.0	339.9	-2	16
2021	Dec	3	16	45	1.91	-23	25	34.4	1.449881	4.6	-1.2	2.4e	5	99.8	304.7	-2	14
2021	Dec	6	17	5	20.04	-24	13	13.8	1.443263	4.6	-1.1	4.0e	9	99.4	295.3	-2	12
2021	Dec	9	17	25	51.72	-24	49	32.8	1.431474	4.7	-1.0	5.7e	12	98.9	289.9	-2	9
2021	Dec	12	17	46	34.72	-25	13	55.7	1.414388	4.7	-0.9	7.3e	16	98.1	285.7	-3	7
2021	Dec	15	18	7	25.63	-25	25	48.3	1.391796	4.8	-0.8	9.0e	20	97.0	282.1	-3	4
2021	Dec	18	18	28	19.47	-25	24	40.1	1.363396	4.9	-0.8	10.6e	25	95.5	278.6	-3	2
2021	Dec	21	18	49	9.24	-25	10	6.3	1.328805	5.0	-0.7	12.3e	30	93.4	275.3	-3	359
2021	Dec	24	19	9	45.12	-24	41	52.8	1.287570	5.2	-0.7	13.9e	35	90.8	272.1	-4	357
2021	Dec	27	19	29	53.24	-24	0	3.1	1.239208	5.4	-0.7	15.5e	42	87.2	269.0	-4	355
2021	Dec	30	19	49	13.83	-23	5	10.7	1.183294	5.6	-0.7	16.9e	50	82.3	266.0	-4	352

Venus

Equinox of J2000

Date	Right Asc.	Declination	Distance	dia	mag	Elong	I	%Ill	Limb	De	Pp						
year	mth	d	h	m	s	o	'	"	AU	"		o	o	o	o	o	o
2021	Jan	1	17	17	15.20	-22	24	46.1	1.559822	10.8	-3.9	20.4w	28	94.1	96.0	0	5
2021	Jan	6	17	44	19.52	-22	56	20.1	1.577210	10.7	-3.9	19.2w	27	94.7	92.8	0	3
2021	Jan	11	18	11	34.00	-23	10	30.3	1.593641	10.6	-3.9	18.0w	25	95.4	89.6	0	360
2021	Jan	16	18	38	51.10	-23	6	54.7	1.609093	10.5	-3.9	16.9w	23	96.0	86.2	0	357
2021	Jan	21	19	6	3.01	-22	45	33.0	1.623582	10.4	-3.9	15.7w	21	96.5	82.8	1	355
2021	Jan	26	19	33	2.55	-22	6	45.8	1.637136	10.3	-3.9	14.5w	20	97.0	79.4	1	352
2021	Jan	31	19	59	43.57	-21	11	12.7	1.649773	10.2	-3.9	13.3w	18	97.5	76.1	1	350
2021	Feb	5	20	26	1.26	-19	59	49.1	1.661485	10.1	-3.9	12.1w	17	97.9	72.8	1	348
2021	Feb	10	20	51	52.12	-18	33	43.7	1.672233	10.1	-3.9	11.0w	15	98.3	69.5	1	345
2021	Feb	15	21	17	13.89	-16	54	16.7	1.681986	10.0	-3.9	9.8w	13	98.7	66.2	1	344
2021	Feb	20	21	42	5.89	-15	2	56.1	1.690744	9.9	-3.9	8.6w	12	99.0	62.9	1	342
2021	Feb	25	22	6	29.03	-13	1	14.3	1.698516	9.9	-3.9	7.4w	10	99.2	59.5	1	341
2021	Mar	2	22	30	25.59	-10	50	44.9	1.705307	9.9	-3.9	6.2w	8	99.5	55.8	1	339
2021	Mar	7	22	53	59.01	-8	33	0.5	1.711091	9.8	-3.9	5.0w	7	99.6	51.3	1	339
2021	Mar	12	23	17	13.26	-6	9	34.3	1.715809	9.8	-3.9	3.9w	5	99.8	45.2	1	338
2021	Mar	17	23	40	12.65	-3	42	0.1	1.719415	9.8	-3.9	2.7w	4	99.9	35.2	0	337
2021	Mar	22	0	3	1.90	-1	11	51.2	1.721886	9.8	-4.0	1.8w	2	100.0	14.3	0	337
2021	Mar	27	0	25	46.08	1	19	20.6	1.723215	9.8	-4.0	1.4e	2	100.0	329.1	0	337
2021	Apr	1	0	48	30.58	3	50	5.3	1.723396	9.8	-4.0	1.9e	3	99.9	288.1	0	337
2021	Apr	6	1	11	20.87	6	18	54.4	1.722389	9.8	-3.9	3.0e	4	99.9	270.7	0	338
2021	Apr	11	1	34	22.03	8	44	17.6	1.720127	9.8	-3.9	4.1e	6	99.7	263.0	0	339
2021	Apr	16	1	57	38.65	11	4	41.9	1.716559	9.8	-3.9	5.4e	7	99.6	259.1	0	340
2021	Apr	21	2	21	14.79	13	18	33.5	1.711658	9.8	-3.9	6.6e	9	99.4	257.2	-1	341
2021	Apr	26	2	45	13.92	15	24	18.3	1.705419	9.9	-3.9	7.9e	11	99.1	256.5	-1	342
2021	May	1	3	9	38.84	17	20	24.1	1.697843	9.9	-3.9	9.2e	13	98.7	256.5	-1	344
2021	May	6	3	34	31.43	19	5	20.6	1.688903	10.0	-3.9	10.5e	15	98.3	257.2	-1	346
2021	May	11	3	59	51.99	20	37	38.7	1.678548	10.0	-3.9	11.8e	17	97.9	258.3	-1	348
2021	May	16	4	25	39.14	21	55	53.9	1.666746	10.1	-3.9	13.1e	19	97.4	259.7	-1	350
2021	May	21	4	51	49.78	22	58	49.7	1.653493	10.2	-3.9	14.5e	21	96.8	261.5	-1	352
2021	May	26	5	18	19.32	23	45	22.2	1.638812	10.3	-3.9	15.8e	23	96.2	263.5	-1	355
2021	May	31	5	45	2.06	24	14	42.5	1.622738	10.4	-3.8	17.1e	25	95.5	265.7	-2	357
2021	Jun	5	6	11	51.38	24	26	19.1	1.605276	10.5	-3.8	18.4e	27	94.7	268.1	-2	0
2021	Jun	10	6	38	39.75	24	19	58.4	1.586415	10.6	-3.8	19.8e	29	93.9	270.5	-2	3
2021	Jun	15	7	5	19.33	23	55	46.5	1.566159	10.7	-3.8	21.1e	31	93.0	273.0	-2	5
2021	Jun	20	7	31	42.61	23	14	9.4	1.544541	10.9	-3.8	22.4e	33	92.1	275.4	-2	8
2021	Jun	25	7	57	43.12	22	15	51.7	1.521623	11.1	-3.8	23.7e	35	91.1	277.7	-2	10
2021	Jun	30	8	23	16.08	21	1	52.7	1.497479	11.2	-3.8	25.0e	37	90.1	280.0	-2	12
2021	Jul	5	8	48	18.33	19	33	22.6	1.472147	11.4	-3.9	26.3e	39	89.0	282.1	-1	14
2021	Jul	10	9	12	48.04	17	51	40.6	1.445652	11.6	-3.9	27.6e	41	87.8	284.1	-1	16
2021	Jul	15	9	36	44.65	15	58	12.2	1.418027	11.9	-3.9	28.8e	43	86.6	285.8	-1	18
2021	Jul	20	10	0	8.80	13	54	27.3	1.389327	12.1	-3.9	30.1e	45	85.4	287.4	-1	19
2021	Jul	25	10	23	2.41	11	41	57.6	1.359642	12.4	-3.9	31.3e	47	84.1	288.8	-1	20
2021	Jul	30	10	45	28.66	9	22	12.0	1.329059	12.7	-3.9	32.5e	49	82.7	290.0	-1	21
2021	Aug	4	11	7	31.50	6	56	37.2	1.297632	13.0	-3.9	33.7e	51	81.4	291.0	0	22
2021	Aug	9	11	29	15.18	4	26	39.2	1.265394	13.3	-3.9	34.9e	53	79.9	291.7	0	22
2021	Aug	14	11	50	44.03	1	53	43.6	1.232380	13.6	-4.0	36.0e	55	78.5	292.3	0	23
2021	Aug	19	12	12	2.34	-0	40	43.5	1.198647	14.0	-4.0	37.1e	57	77.0	292.6	1	23
2021	Aug	24	12	33	14.62	-3	15	17.5	1.164281	14.4	-4.0	38.1e	59	75.4	292.8	1	23
2021	Aug	29	12	54	25.67	-5	48	37.2	1.129360	14.9	-4.0	39.2e	61	73.9	292.7	1	22

2021 Sep 3	13 15 40.17	- 8 19 22.9	1.093929	15.4	-4.0	40.2e	64	72.2	292.5	2	22
2021 Sep 8	13 37 2.29	-10 46 13.5	1.058013	15.9	-4.1	41.1e	66	70.6	292.0	2	21
2021 Sep 13	13 58 35.41	-13 7 45.4	1.021630	16.5	-4.1	42.0e	68	68.9	291.3	2	20
2021 Sep 18	14 20 21.92	-15 22 32.7	0.984826	17.1	-4.1	42.9e	70	67.1	290.4	3	19
2021 Sep 23	14 42 23.56	-17 29 11.2	0.947675	17.7	-4.2	43.7e	72	65.3	289.3	3	18
2021 Sep 28	15 4 41.38	-19 26 21.0	0.910244	18.5	-4.2	44.4e	74	63.4	288.0	3	16
2021 Oct 3	15 27 15.16	-21 12 45.5	0.872572	19.3	-4.3	45.1e	77	61.4	286.6	3	15
2021 Oct 8	15 50 2.96	-22 47 12.0	0.834678	20.2	-4.3	45.7e	79	59.4	284.9	4	13
2021 Oct 13	16 13 0.43	-24 8 32.6	0.796579	21.1	-4.4	46.2e	82	57.3	283.1	4	11
2021 Oct 18	16 36 0.77	-25 15 48.6	0.758330	22.2	-4.4	46.6e	84	55.1	281.2	4	9
2021 Oct 23	16 58 55.43	-26 8 16.9	0.720022	23.4	-4.5	46.9e	87	52.8	279.2	4	7
2021 Oct 28	17 21 34.32	-26 45 33.6	0.681743	24.7	-4.5	47.0e	90	50.3	277.2	4	5
2021 Nov 2	17 43 45.60	-27 7 34.3	0.643570	26.1	-4.6	47.0e	93	47.7	275.1	4	3
2021 Nov 7	18 5 15.48	-27 14 34.7	0.605570	27.8	-4.6	46.8e	96	45.0	273.1	4	1
2021 Nov 12	18 25 47.47	-27 7 11.9	0.567831	29.6	-4.7	46.3e	99	42.0	271.1	4	359
2021 Nov 17	18 45 2.87	-26 46 26.0	0.530514	31.7	-4.7	45.6e	103	38.9	269.2	4	357
2021 Nov 22	19 2 41.85	-26 13 39.7	0.493837	34.1	-4.8	44.6e	107	35.5	267.4	4	355
2021 Nov 27	19 18 23.14	-25 30 35.1	0.458063	36.7	-4.8	43.1e	111	31.9	265.8	4	354
2021 Dec 2	19 31 43.32	-24 39 9.0	0.423503	39.7	-4.9	41.1e	116	27.9	264.3	3	352
2021 Dec 7	19 42 15.57	-23 41 29.4	0.390531	43.1	-4.9	38.6e	122	23.7	263.0	2	351
2021 Dec 12	19 49 28.62	-22 39 53.4	0.359654	46.8	-4.9	35.3e	128	19.2	261.7	2	351
2021 Dec 17	19 52 50.38	-21 36 40.8	0.331585	50.7	-4.8	31.1e	135	14.6	260.3	1	350
2021 Dec 22	19 51 55.27	-20 34 2.2	0.307218	54.7	-4.7	26.0e	143	10.0	258.5	0	350
2021 Dec 27	19 46 35.46	-19 33 52.5	0.287589	58.5	-4.5	19.9e	152	5.8	255.3	-1	351

Mars  
Equinox of J2000

Date	Right Asc.	Declination	Distance	dia	mag	Elong	I	%Ill	Limb	De	Pp
year mth d	h m s	o ' "	AU	"		o	o		o	o	o
2021 Jan 1	1 39 11.91	11 14 22.7	0.898572	10.4	-0.2	106.6e	39	89.1	249.1	-23	323
2021 Jan 6	1 47 30.81	12 7 8.0	0.944240	9.9	-0.1	103.7e	39	88.8	249.5	-22	322
2021 Jan 11	1 56 18.23	13 0 35.4	0.990742	9.4	0.0	100.9e	39	88.7	249.9	-22	322
2021 Jan 16	2 5 32.16	13 54 23.5	1.037948	9.0	0.1	98.2e	40	88.6	250.3	-21	322
2021 Jan 21	2 15 10.41	14 48 8.9	1.085709	8.6	0.2	95.6e	40	88.5	250.8	-20	321
2021 Jan 26	2 25 10.73	15 41 27.0	1.133899	8.3	0.3	93.1e	40	88.5	251.4	-19	321
2021 Jan 31	2 35 31.18	16 33 54.0	1.182430	7.9	0.4	90.7e	40	88.6	252.0	-18	321
2021 Feb 5	2 46 10.32	17 25 9.4	1.231240	7.6	0.5	88.3e	39	88.7	252.6	-17	321
2021 Feb 10	2 57 7.28	18 14 55.7	1.280253	7.3	0.6	86.0e	39	88.8	253.4	-16	321
2021 Feb 15	3 8 21.21	19 2 56.5	1.329353	7.0	0.7	83.7e	39	89.0	254.1	-15	321
2021 Feb 20	3 19 50.93	19 48 53.7	1.378419	6.8	0.8	81.5e	38	89.2	255.0	-14	322
2021 Feb 25	3 31 35.15	20 32 29.1	1.427354	6.6	0.9	79.3e	38	89.4	255.8	-13	322
2021 Mar 2	3 43 32.66	21 13 25.5	1.476098	6.3	0.9	77.1e	38	89.6	256.8	-12	322
2021 Mar 7	3 55 42.64	21 51 28.8	1.524610	6.1	1.0	75.0e	37	89.9	257.8	-11	323
2021 Mar 12	4 8 4.53	22 26 26.8	1.572815	6.0	1.1	73.0e	37	90.2	258.8	-10	324
2021 Mar 17	4 20 37.50	22 58 7.3	1.620609	5.8	1.1	70.9e	36	90.5	259.9	-8	324
2021 Mar 22	4 33 20.42	23 26 18.1	1.667891	5.6	1.2	68.9e	35	90.8	261.0	-7	325
2021 Mar 27	4 46 12.00	23 50 47.6	1.714591	5.5	1.2	66.9e	35	91.1	262.1	-6	326
2021 Apr 1	4 59 11.04	24 11 26.0	1.760670	5.3	1.3	65.0e	34	91.4	263.3	-4	327
2021 Apr 6	5 12 16.68	24 28 6.1	1.806100	5.2	1.3	63.0e	33	91.7	264.5	-3	329
2021 Apr 11	5 25 28.14	24 40 41.8	1.850809	5.1	1.4	61.1e	33	92.1	265.8	-2	330
2021 Apr 16	5 38 44.33	24 49 7.8	1.894705	4.9	1.4	59.2e	32	92.4	267.0	0	331
2021 Apr 21	5 52 3.97	24 53 19.3	1.937710	4.8	1.5	57.4e	31	92.8	268.3	1	333
2021 Apr 26	6 5 25.69	24 53 13.3	1.979775	4.7	1.5	55.5e	30	93.1	269.5	2	334
2021 May 1	6 18 48.33	24 48 48.6	2.020885	4.6	1.6	53.7e	30	93.4	270.8	4	336
2021 May 6	6 32 11.08	24 40 5.6	2.061017	4.5	1.6	51.9e	29	93.8	272.1	5	337
2021 May 11	6 45 33.17	24 27 5.4	2.100103	4.5	1.6	50.1e	28	94.1	273.3	6	339
2021 May 16	6 58 53.60	24 9 50.3	2.138066	4.4	1.7	48.4e	27	94.4	274.5	8	341
2021 May 21	7 12 11.32	23 48 23.8	2.174849	4.3	1.7	46.6e	26	94.8	275.8	9	342
2021 May 26	7 25 25.30	23 22 50.7	2.210425	4.2	1.7	44.9e	26	95.1	276.9	10	344
2021 May 31	7 38 34.89	22 53 17.0	2.244798	4.2	1.7	43.1e	25	95.4	278.1	12	346
2021 Jun 5	7 51 39.74	22 19 48.9	2.277942	4.1	1.7	41.4e	24	95.7	279.2	13	348
2021 Jun 10	8 4 39.50	21 42 33.4	2.309796	4.1	1.8	39.7e	23	96.0	280.3	14	350
2021 Jun 15	8 17 33.69	21 1 38.1	2.340299	4.0	1.8	38.0e	22	96.3	281.3	15	352
2021 Jun 20	8 30 21.86	20 17 12.0	2.369412	4.0	1.8	36.3e	21	96.6	282.3	16	354
2021 Jun 25	8 43 3.65	19 29 24.6	2.397131	3.9	1.8	34.6e	20	96.9	283.2	17	356
2021 Jun 30	8 55 39.12	18 38 25.3	2.423468	3.9	1.8	33.0e	19	97.2	284.1	18	358

2021 Jul 5	9 8	8.51	17 44 23.1	2.448395	3.8	1.8	31.3e	18	97.4	284.9	19	360
2021 Jul 10	9 20	32.01	16 47 27.4	2.471859	3.8	1.8	29.6e	18	97.7	285.7	20	2
2021 Jul 15	9 32	49.73	15 47 48.4	2.493814	3.8	1.8	28.0e	17	97.9	286.4	21	4
2021 Jul 20	9 45	1.75	14 45 37.1	2.514238	3.7	1.8	26.3e	16	98.1	287.0	22	6
2021 Jul 25	9 57	8.35	13 41 4.5	2.533148	3.7	1.8	24.7e	15	98.3	287.5	23	8
2021 Jul 30	10 9	10.14	12 34 20.5	2.550557	3.7	1.8	23.0e	14	98.6	288.0	23	10
2021 Aug 4	10 21	7.76	11 25 34.7	2.566439	3.6	1.8	21.4e	13	98.7	288.4	24	12
2021 Aug 9	10 33	1.77	10 14 57.0	2.580749	3.6	1.8	19.8e	12	98.9	288.8	24	13
2021 Aug 14	10 44	52.66	9 2 38.4	2.593456	3.6	1.8	18.1e	11	99.1	289.0	25	15
2021 Aug 19	10 56	40.89	7 48 50.8	2.604559	3.6	1.8	16.5e	10	99.2	289.2	25	17
2021 Aug 24	11 8	27.12	6 33 45.1	2.614091	3.6	1.8	14.9e	9	99.4	289.2	26	19
2021 Aug 29	11 20	12.24	5 17 31.0	2.622065	3.6	1.8	13.2e	8	99.5	289.1	26	21
2021 Sep 3	11 31	57.12	4 0 18.5	2.628458	3.6	1.8	11.6e	7	99.6	288.9	26	23
2021 Sep 8	11 43	42.51	2 42 18.4	2.633240	3.6	1.8	9.9e	6	99.7	288.4	26	25
2021 Sep 13	11 55	29.05	1 23 42.6	2.636394	3.6	1.7	8.3e	5	99.8	287.7	26	26
2021 Sep 18	12 7	17.42	0 4 43.7	2.637947	3.5	1.7	6.7e	4	99.9	286.6	26	28
2021 Sep 23	12 19	8.50	- 1 14 26.8	2.637942	3.5	1.7	5.0e	3	99.9	284.7	25	29
2021 Sep 28	12 31	3.27	- 2 33 38.1	2.636394	3.6	1.7	3.4e	2	100.0	281.0	25	31
2021 Oct 3	12 43	2.68	- 3 52 39.0	2.633292	3.6	1.7	1.8e	1	100.0	270.9	25	32
2021 Oct 8	12 55	7.54	- 5 11 16.6	2.628621	3.6	1.6	0.7e	0	100.0	207.5	24	33
2021 Oct 13	13 7	18.51	- 6 29 16.8	2.622386	3.6	1.6	1.7w	1	100.0	133.5	23	34
2021 Oct 18	13 19	36.34	- 7 46 25.3	2.614642	3.6	1.6	3.3w	2	100.0	122.0	23	35
2021 Oct 23	13 32	1.93	- 9 2 28.6	2.605441	3.6	1.7	4.9w	3	99.9	117.7	22	36
2021 Oct 28	13 44	36.23	-10 17 13.7	2.594808	3.6	1.7	6.5w	4	99.9	115.2	21	37
2021 Nov 2	13 57	20.09	-11 30 26.3	2.582746	3.6	1.7	8.2w	5	99.8	113.4	20	38
2021 Nov 7	14 10	14.17	-12 41 50.5	2.569256	3.6	1.6	9.8w	6	99.7	112.0	19	38
2021 Nov 12	14 23	18.92	-13 51 9.1	2.554377	3.7	1.6	11.5w	7	99.6	110.6	18	38
2021 Nov 17	14 36	34.90	-14 58 5.4	2.538185	3.7	1.6	13.1w	8	99.5	109.3	17	39
2021 Nov 22	14 50	2.77	-16 2 23.5	2.520744	3.7	1.6	14.7w	9	99.4	108.1	16	39
2021 Nov 27	15 3 43.10	-17 3 47.4	2.502090	3.7	1.6	16.3w	10	99.2	106.8	15	39	
2021 Dec 2	15 17 36.29	-18 1 59.8	2.482243	3.8	1.6	17.9w	11	99.1	105.6	13	38	
2021 Dec 7	15 31 42.40	-18 56 42.7	2.461225	3.8	1.6	19.6w	12	98.9	104.2	12	38	
2021 Dec 12	15 46 1.28	-19 47 37.3	2.439106	3.8	1.6	21.2w	13	98.7	102.9	11	37	
2021 Dec 17	16 0 32.84	-20 34 26.4	2.415978	3.9	1.6	22.7w	14	98.5	101.5	9	37	
2021 Dec 22	16 15 16.96	-21 16 53.9	2.391914	3.9	1.6	24.3w	15	98.3	100.1	8	36	
2021 Dec 27	16 30 13.37	-21 54 43.8	2.366962	4.0	1.6	25.9w	16	98.0	98.6	6	35	

Jupiter  
Equinox of J2000

Date	Right Asc.	Declination	Distance	dia	mag	Elong	I	%Ill	Limb	De	Pp
year mth d	h m s	o ' "	AU	"		o	o		o	o	o
2021 Jan 1	20 19 34.14	-20 4 36.6	5.994006	32.9	-1.8	22.0e	4	99.9	258.1	-1	345
2021 Jan 6	20 24 19.72	-19 49 0.2	6.019741	32.7	-1.8	18.1e	3	99.9	258.0	-1	345
2021 Jan 11	20 29 7.82	-19 32 45.6	6.040383	32.6	-1.8	14.1e	3	99.9	258.0	-1	344
2021 Jan 16	20 33 57.65	-19 15 54.8	6.055807	32.5	-1.8	10.2e	2	100.0	258.5	-1	344
2021 Jan 21	20 38 48.38	-18 58 30.7	6.065948	32.5	-1.8	6.3e	1	100.0	259.9	-1	343
2021 Jan 26	20 43 39.25	-18 40 36.0	6.070796	32.4	-1.8	2.4e	0	100.0	267.2	-1	343
2021 Jan 31	20 48 29.60	-18 22 13.8	6.070370	32.4	-1.8	1.6w	0	100.0	55.2	-1	343
2021 Feb 5	20 53 18.83	-18 3 27.1	6.064679	32.5	-1.8	5.4w	1	100.0	68.5	0	342
2021 Feb 10	20 58 6.33	-17 44 19.2	6.053719	32.5	-1.8	9.3w	2	100.0	70.5	0	342
2021 Feb 15	21 2 51.38	-17 24 53.8	6.037513	32.6	-1.8	13.2w	3	100.0	71.1	0	341
2021 Feb 20	21 7 33.25	-17 5 15.1	6.016148	32.7	-1.8	17.0w	3	99.9	71.3	0	341
2021 Feb 25	21 12 11.29	-16 45 27.6	5.989752	32.9	-1.8	20.9w	4	99.9	71.3	0	341
2021 Mar 2	21 16 44.95	-16 25 35.3	5.958467	33.1	-1.8	24.8w	5	99.8	71.2	0	340
2021 Mar 7	21 21 13.70	-16 5 42.4	5.922412	33.3	-1.8	28.7w	5	99.8	71.1	0	340
2021 Mar 12	21 25 36.89	-15 45 53.6	5.881700	33.5	-1.8	32.6w	6	99.7	70.9	0	340
2021 Mar 17	21 29 53.83	-15 26 13.9	5.836498	33.7	-1.9	36.5w	7	99.7	70.8	0	339
2021 Mar 22	21 34 3.84	-15 6 48.9	5.787028	34.0	-1.9	40.4w	7	99.6	70.6	0	339
2021 Mar 27	21 38 6.30	-14 47 43.6	5.733535	34.3	-1.9	44.3w	8	99.5	70.4	0	339
2021 Apr 1	21 42 0.68	-14 29 3.0	5.676264	34.7	-1.9	48.3w	8	99.5	70.3	0	339
2021 Apr 6	21 45 46.38	-14 10 52.2	5.615428	35.1	-1.9	52.2w	9	99.4	70.1	0	338
2021 Apr 11	21 49 22.68	-13 53 17.0	5.551265	35.5	-2.0	56.2w	9	99.3	70.0	0	338
2021 Apr 16	21 52 48.85	-13 36 23.4	5.484074	35.9	-2.0	60.2w	10	99.3	69.8	0	338
2021 Apr 21	21 56 4.16	-13 20 17.4	5.414193	36.4	-2.0	64.3w	10	99.2	69.7	0	338
2021 Apr 26	21 59 7.98	-13 5 4.6	5.341974	36.9	-2.0	68.4w	11	99.1	69.6	0	338
2021 May 1	22 1 59.73	-12 50 50.2	5.267750	37.4	-2.1	72.5w	11	99.1	69.5	0	338

2021	May	6	22	4	38.67	-12	37	39.9	5.191839	37.9	-2.1	76.7w	11	99.0	69.4	0	337
2021	May	11	22	7	4.01	-12	25	39.9	5.114609	38.5	-2.1	80.9w	11	99.0	69.4	0	337
2021	May	16	22	9	14.97	-12	14	56.0	5.036485	39.1	-2.2	85.1w	12	99.0	69.3	1	337
2021	May	21	22	11	10.85	-12	5	33.9	4.957920	39.7	-2.2	89.5w	12	99.0	69.3	1	337
2021	May	26	22	12	51.08	-11	57	38.0	4.879366	40.4	-2.2	93.8w	12	99.0	69.3	1	337
2021	May	31	22	14	15.09	-11	51	12.6	4.801244	41.0	-2.3	98.3w	11	99.0	69.3	1	337
2021	Jun	5	22	15	22.20	-11	46	22.0	4.723991	41.7	-2.3	102.8w	11	99.0	69.3	1	337
2021	Jun	10	22	16	11.78	-11	43	10.5	4.648106	42.4	-2.3	107.4w	11	99.1	69.3	1	337
2021	Jun	15	22	16	43.38	-11	41	40.9	4.574125	43.1	-2.4	112.0w	11	99.1	69.4	1	337
2021	Jun	20	22	16	56.73	-11	41	54.8	4.502592	43.7	-2.4	116.7w	10	99.2	69.5	1	337
2021	Jun	25	22	16	51.78	-11	43	52.0	4.434020	44.4	-2.5	121.5w	10	99.3	69.6	1	337
2021	Jun	30	22	16	28.54	-11	47	31.7	4.368889	45.1	-2.5	126.4w	9	99.3	69.8	1	337
2021	Jul	5	22	15	47.10	-11	52	52.2	4.307713	45.7	-2.5	131.4w	9	99.4	70.0	1	337
2021	Jul	10	22	14	47.83	-11	59	49.9	4.251036	46.3	-2.6	136.4w	8	99.5	70.2	1	337
2021	Jul	15	22	13	31.48	-12	8	19.3	4.199396	46.9	-2.6	141.5w	7	99.6	70.5	1	337
2021	Jul	20	22	11	59.18	-12	18	12.1	4.153283	47.4	-2.6	146.7w	6	99.7	70.9	1	337
2021	Jul	25	22	10	12.31	-12	29	18.5	4.113109	47.9	-2.6	151.9w	5	99.8	71.4	1	337
2021	Jul	30	22	8	12.41	-12	41	27.5	4.079244	48.3	-2.7	157.2w	4	99.8	72.1	1	337
2021	Aug	4	22	6	1.29	-12	54	27.2	4.052056	48.6	-2.7	162.6w	3	99.9	73.2	1	337
2021	Aug	9	22	3	41.13	-13	8	3.9	4.031876	48.8	-2.7	167.9w	2	100.0	75.1	1	337
2021	Aug	14	22	1	14.47	-13	22	2.2	4.018955	49.0	-2.7	173.3w	1	100.0	79.9	1	338
2021	Aug	19	21	58	44.10	-13	36	5.9	4.013425	49.1	-2.7	178.4w	0	100.0	116.9	1	338
2021	Aug	24	21	56	12.75	-13	49	59.4	4.015315	49.0	-2.7	175.5e	1	100.0	234.8	1	338
2021	Aug	29	21	53	43.10	-14	3	28.3	4.024604	48.9	-2.7	170.1e	2	100.0	243.3	1	338
2021	Sep	3	21	51	17.90	-14	16	18.7	4.041233	48.7	-2.7	164.7e	3	99.9	245.9	1	338
2021	Sep	8	21	48	59.90	-14	28	17.1	4.065060	48.4	-2.7	159.2e	4	99.9	247.3	1	338
2021	Sep	13	21	46	51.78	-14	39	11.3	4.095837	48.1	-2.7	153.8e	5	99.8	248.1	1	338
2021	Sep	18	21	44	55.90	-14	48	50.7	4.133204	47.6	-2.6	148.5e	6	99.7	248.7	1	339
2021	Sep	23	21	43	14.18	-14	57	7.5	4.176752	47.2	-2.6	143.2e	7	99.6	249.2	1	339
2021	Sep	28	21	41	48.25	-15	3	55.8	4.226068	46.6	-2.6	137.9e	8	99.5	249.6	1	339
2021	Oct	3	21	40	39.50	-15	9	10.6	4.280710	46.0	-2.5	132.7e	8	99.5	249.9	1	339
2021	Oct	8	21	39	49.11	-15	12	48.1	4.340188	45.4	-2.5	127.6e	9	99.4	250.1	1	339
2021	Oct	13	21	39	17.96	-15	14	45.6	4.403938	44.7	-2.5	122.5e	10	99.3	250.3	1	339
2021	Oct	18	21	39	6.42	-15	15	2.5	4.471366	44.0	-2.4	117.5e	10	99.2	250.4	1	339
2021	Oct	23	21	39	14.56	-15	13	39.3	4.541913	43.4	-2.4	112.6e	11	99.2	250.6	1	339
2021	Oct	28	21	39	42.27	-15	10	37.3	4.615046	42.7	-2.4	107.7e	11	99.1	250.6	1	339
2021	Nov	2	21	40	29.31	-15	5	57.7	4.690237	42.0	-2.3	102.9e	11	99.1	250.7	1	339
2021	Nov	7	21	41	35.36	-14	59	42.1	4.766933	41.3	-2.3	98.2e	11	99.0	250.7	1	339
2021	Nov	12	21	42	59.83	-14	51	52.4	4.844550	40.7	-2.3	93.5e	11	99.0	250.7	1	339
2021	Nov	17	21	44	41.89	-14	42	31.9	4.922545	40.0	-2.2	88.9e	11	99.0	250.7	1	339
2021	Nov	22	21	46	40.65	-14	31	43.8	5.000434	39.4	-2.2	84.4e	11	99.0	250.7	1	338
2021	Nov	27	21	48	55.24	-14	19	31.2	5.077768	38.8	-2.2	79.9e	11	99.0	250.6	1	338
2021	Dec	2	21	51	24.84	-14	5	56.9	5.154102	38.2	-2.1	75.5e	11	99.1	250.6	1	338
2021	Dec	7	21	54	8.57	-13	51	3.6	5.228972	37.7	-2.1	71.1e	11	99.1	250.5	1	338
2021	Dec	12	21	57	5.43	-13	34	54.9	5.301921	37.1	-2.1	66.8e	10	99.2	250.4	1	338
2021	Dec	17	22	0	14.35	-13	17	34.5	5.372560	36.7	-2.1	62.6e	10	99.2	250.4	1	338
2021	Dec	22	22	3	34.34	-12	59	6.3	5.440556	36.2	-2.0	58.3e	10	99.3	250.3	1	337
2021	Dec	27	22	7	4.53	-12	39	33.7	5.505596	35.8	-2.0	54.2e	9	99.4	250.2	1	337

Saturn  
Equinox of J2000

Date	Right Asc.	Declination	Distance	dia	mag	Elong	I	%Ill	Limb	De	Pp						
year mth d	h m s	o ' "	AU	"		o	o		o	o	o						
2021	Jan	1	20	14	39.73	-20	14	13.8	10.899784	15.3	0.6	20.8e	2	100.0	258.3	21	7
2021	Jan	6	20	17	3.22	-20	6	51.9	10.926043	15.3	0.6	16.3e	2	100.0	258.4	21	7
2021	Jan	11	20	19	28.74	-19	59	16.2	10.946018	15.2	0.6	11.8e	1	100.0	258.8	21	7
2021	Jan	16	20	21	55.65	-19	51	28.6	10.959555	15.2	0.6	7.3e	1	100.0	259.8	20	7
2021	Jan	21	20	24	23.30	-19	43	31.0	10.966576	15.2	0.6	2.8e	0	100.0	264.7	20	7
2021	Jan	26	20	26	51.06	-19	35	25.8	10.967077	15.2	0.6	1.7w	0	100.0	62.4	20	7
2021	Jan	31	20	29	18.35	-19	27	14.8	10.961092	15.2	0.6	6.2w	1	100.0	72.1	20	7
2021	Feb	5	20	31	44.63	-19	19	0.4	10.948663	15.2	0.6	10.7w	1	100.0	73.6	19	7
2021	Feb	10	20	34	9.34	-19	10	44.6	10.929830	15.2	0.7	15.1w	1	100.0	74.0	19	7
2021	Feb	15	20	36	31.86	-19	2	30.1	10.904682	15.3	0.7	19.6w	2	100.0	74.2	19	7
2021	Feb	20	20	38	51.57	-18	54	19.5	10.873390	15.3	0.7	24.1w	2	100.0	74.3	19	7
2021	Feb	25	20	41	7.92	-18	46	15.5	10.836175	15.4	0.7	28.6w	3	99.9	74.3	19	7

2021	Mar	2	20 43	20.40	-18 38	20.6	10.793283	15.4	0.7	33.1w	3	99.9	74.2	18	7
2021	Mar	7	20 45	28.52	-18 30	37.3	10.744946	15.5	0.7	37.5w	3	99.9	74.1	18	7
2021	Mar	12	20 47	31.75	-18 23	8.3	10.691412	15.6	0.7	42.0w	4	99.9	74.1	18	7
2021	Mar	17	20 49	29.52	-18 15	56.5	10.632996	15.7	0.7	46.5w	4	99.9	74.0	18	7
2021	Mar	22	20 51	21.31	-18 9	4.7	10.570079	15.8	0.8	51.1w	4	99.8	73.9	18	7
2021	Mar	27	20 53	6.66	-18 2	35.6	10.503071	15.9	0.8	55.6w	5	99.8	73.8	18	7
2021	Apr	1	20 54	45.15	-17 56	31.7	10.432380	16.0	0.8	60.1w	5	99.8	73.8	17	7
2021	Apr	6	20 56	16.38	-17 50	55.3	10.358395	16.1	0.8	64.7w	5	99.8	73.7	17	7
2021	Apr	11	20 57	39.87	-17 45	49.0	10.281544	16.2	0.8	69.2w	5	99.8	73.6	17	7
2021	Apr	16	20 58	55.19	-17 41	15.3	10.202322	16.3	0.7	73.8w	6	99.8	73.6	17	7
2021	Apr	21	21 0	1.97	-17 37	16.4	10.121260	16.5	0.7	78.4w	6	99.8	73.5	17	7
2021	Apr	26	21 0	59.91	-17 33	54.1	10.038895	16.6	0.7	83.1w	6	99.7	73.5	17	7
2021	May	1	21 1	48.77	-17 31	9.9	9.955738	16.7	0.7	87.7w	6	99.7	73.5	17	7
2021	May	6	21 2	28.30	-17 29	5.3	9.872289	16.9	0.7	92.4w	6	99.7	73.5	17	7
2021	May	11	21 2	58.22	-17 27	41.6	9.789102	17.0	0.7	97.1w	6	99.7	73.5	17	7
2021	May	16	21 3	18.37	-17 26	59.7	9.706772	17.2	0.7	101.9w	6	99.8	73.6	17	7
2021	May	21	21 3	28.67	-17 27	0.1	9.625901	17.3	0.6	106.7w	6	99.8	73.6	17	7
2021	May	26	21 3	29.18	-17 27	42.5	9.547059	17.5	0.6	111.5w	5	99.8	73.7	17	7
2021	May	31	21 3	19.97	-17 29	6.4	9.470772	17.6	0.6	116.3w	5	99.8	73.7	17	7
2021	Jun	5	21 3	1.12	-17 31	11.0	9.397573	17.7	0.5	121.2w	5	99.8	73.8	17	7
2021	Jun	10	21 2	32.82	-17 33	55.3	9.328032	17.9	0.5	126.1w	5	99.8	74.0	17	7
2021	Jun	15	21 1	55.37	-17 37	17.5	9.262715	18.0	0.5	131.0w	4	99.9	74.1	17	7
2021	Jun	20	21 1	9.24	-17 41	15.0	9.202152	18.1	0.5	136.0w	4	99.9	74.3	17	7
2021	Jun	25	21 0	15.00	-17 45	44.8	9.146802	18.2	0.4	141.0w	4	99.9	74.5	17	7
2021	Jun	30	20 59	13.23	-17 50	43.8	9.097072	18.3	0.4	146.0w	3	99.9	74.8	17	7
2021	Jul	5	20 58	4.58	-17 56	8.4	9.053373	18.4	0.4	151.1w	3	99.9	75.1	17	7
2021	Jul	10	20 56	49.82	-18 1	54.7	9.016109	18.5	0.3	156.1w	2	100.0	75.6	18	7
2021	Jul	15	20 55	29.89	-18 7	58.4	8.985628	18.5	0.3	161.2w	2	100.0	76.2	18	7
2021	Jul	20	20 54	5.82	-18 14	14.7	8.962194	18.6	0.3	166.4w	1	100.0	77.2	18	7
2021	Jul	25	20 52	38.66	-18 20	38.6	8.945973	18.6	0.2	171.5w	1	100.0	79.3	18	7
2021	Jul	30	20 51	9.45	-18 27	5.5	8.937087	18.6	0.2	176.6w	0	100.0	87.3	18	7
2021	Aug	4	20 49	39.28	-18 33	30.9	8.935647	18.7	0.2	178.0e	0	100.0	231.1	18	7
2021	Aug	9	20 48	9.32	-18 39	50.0	8.941707	18.6	0.2	173.0e	1	100.0	248.1	18	7
2021	Aug	14	20 46	40.77	-18 45	58.1	8.955234	18.6	0.2	167.8e	1	100.0	251.0	19	7
2021	Aug	19	20 45	14.84	-18 51	50.7	8.976085	18.6	0.2	162.7e	2	100.0	252.2	19	7
2021	Aug	24	20 43	52.61	-18 57	23.9	9.004043	18.5	0.3	157.5e	2	100.0	252.9	19	7
2021	Aug	29	20 42	35.07	-19 2	34.3	9.038875	18.4	0.3	152.4e	3	99.9	253.4	19	7
2021	Sep	3	20 41	23.20	-19 7	18.6	9.080322	18.4	0.3	147.3e	3	99.9	253.8	19	7
2021	Sep	8	20 40	17.97	-19 11	34.0	9.128057	18.3	0.3	142.2e	4	99.9	254.1	19	7
2021	Sep	13	20 39	20.26	-19 15	17.7	9.181667	18.2	0.4	137.1e	4	99.9	254.4	19	7
2021	Sep	18	20 38	30.81	-19 18	27.7	9.240662	18.0	0.4	132.0e	4	99.9	254.6	19	7
2021	Sep	23	20 37	50.19	-19 21	2.3	9.304538	17.9	0.4	126.9e	5	99.8	254.7	19	7
2021	Sep	28	20 37	18.86	-19 23	0.5	9.372805	17.8	0.5	121.9e	5	99.8	254.9	19	7
2021	Oct	3	20 36	57.25	-19 24	21.4	9.444948	17.6	0.5	116.9e	5	99.8	255.0	19	7
2021	Oct	8	20 36	45.72	-19 25	4.0	9.520407	17.5	0.5	111.9e	5	99.8	255.1	19	7
2021	Oct	13	20 36	44.50	-19 25	7.8	9.598561	17.4	0.5	107.0e	6	99.8	255.2	19	7
2021	Oct	18	20 36	53.66	-19 24	32.8	9.678776	17.2	0.6	102.1e	6	99.8	255.3	19	7
2021	Oct	23	20 37	13.13	-19 23	19.3	9.760460	17.1	0.6	97.2e	6	99.8	255.3	19	7
2021	Oct	28	20 37	42.83	-19 21	27.6	9.843045	16.9	0.6	92.3e	6	99.7	255.3	19	7
2021	Nov	2	20 38	22.62	-19 18	58.2	9.925955	16.8	0.6	87.5e	6	99.8	255.4	19	7
2021	Nov	7	20 39	12.33	-19 15	51.3	10.008584	16.7	0.6	82.7e	6	99.8	255.4	19	7
2021	Nov	12	20 40	11.65	-19 12	7.7	10.090308	16.5	0.7	77.9e	6	99.8	255.3	19	7
2021	Nov	17	20 41	20.17	-19 7	48.5	10.170548	16.4	0.7	73.2e	5	99.8	255.3	19	7
2021	Nov	22	20 42	37.44	-19 2	54.8	10.248790	16.3	0.7	68.4e	5	99.8	255.3	19	7
2021	Nov	27	20 44	3.05	-18 57	27.7	10.324540	16.1	0.7	63.7e	5	99.8	255.3	19	7
2021	Dec	2	20 45	36.54	-18 51	28.3	10.397309	16.0	0.7	59.0e	5	99.8	255.2	19	7
2021	Dec	7	20 47	17.45	-18 44	57.8	10.466590	15.9	0.7	54.4e	5	99.8	255.2	18	7
2021	Dec	12	20 49	5.19	-18 37	57.6	10.531903	15.8	0.7	49.7e	4	99.9	255.2	18	7
2021	Dec	17	20 50	59.15	-18 30	29.5	10.592850	15.7	0.7	45.1e	4	99.9	255.2	18	7
2021	Dec	22	20 52	58.76	-18 22	35.2	10.649087	15.7	0.7	40.5e	4	99.9	255.1	18	7
2021	Dec	27	20 55	3.46	-18 14	16.4	10.700292	15.6	0.7	35.9e	3	99.9	255.2	18	7

Uranus  
Equinox of J2000

Date	Right Asc.	Declination	Distance	dia	mag	Elong	I	%Ill	Limb	De	Pp
year mth d	h m s	o ' "	AU	"		o	o		o	o	o



2021	Jan	1	2	17	19.90	13	15	42.0	19.321273	3.5	5.7	116.0e	3	100.0	250.6	48	262
2021	Jan	6	2	17	8.81	13	14	55.1	19.399937	3.5	5.7	110.9e	3	99.9	250.6	48	262
2021	Jan	11	2	17	2.69	13	14	33.5	19.481349	3.5	5.7	105.7e	3	99.9	250.7	48	262
2021	Jan	16	2	17	1.65	13	14	37.8	19.564846	3.5	5.8	100.6e	3	99.9	250.7	48	262
2021	Jan	21	2	17	5.74	13	15	8.3	19.649723	3.5	5.8	95.6e	3	99.9	250.8	48	262
2021	Jan	26	2	17	14.93	13	16	4.7	19.735294	3.5	5.8	90.5e	3	99.9	250.8	48	262
2021	Jan	31	2	17	29.16	13	17	26.5	19.820915	3.5	5.8	85.5e	3	99.9	250.9	48	262
2021	Feb	5	2	17	48.34	13	19	13.2	19.905975	3.4	5.8	80.5e	3	99.9	250.9	48	262
2021	Feb	10	2	18	12.38	13	21	24.2	19.989855	3.4	5.8	75.6e	3	99.9	251.0	48	262
2021	Feb	15	2	18	41.15	13	23	58.7	20.071911	3.4	5.8	70.6e	3	99.9	251.1	49	262
2021	Feb	20	2	19	14.45	13	26	55.6	20.151515	3.4	5.8	65.7e	3	99.9	251.1	49	262
2021	Feb	25	2	19	52.07	13	30	13.5	20.228105	3.4	5.8	60.9e	3	100.0	251.2	49	262
2021	Mar	2	2	20	33.74	13	33	50.9	20.301182	3.4	5.8	56.0e	2	100.0	251.3	49	262
2021	Mar	7	2	21	19.25	13	37	46.6	20.370288	3.4	5.8	51.2e	2	100.0	251.4	49	263
2021	Mar	12	2	22	8.35	13	41	59.1	20.434951	3.4	5.8	46.4e	2	100.0	251.5	49	263
2021	Mar	17	2	23	0.75	13	46	26.8	20.494713	3.3	5.9	41.7e	2	100.0	251.6	50	263
2021	Mar	22	2	23	56.14	13	51	8.1	20.549174	3.3	5.9	36.9e	2	100.0	251.8	50	263
2021	Mar	27	2	24	54.19	13	56	1.0	20.598015	3.3	5.9	32.2e	2	100.0	251.9	50	263
2021	Apr	1	2	25	54.59	14	1	3.8	20.640978	3.3	5.9	27.5e	1	100.0	252.1	50	263
2021	Apr	6	2	26	57.05	14	6	15.1	20.677828	3.3	5.9	22.9e	1	100.0	252.4	51	263
2021	Apr	11	2	28	1.24	14	11	33.0	20.708319	3.3	5.9	18.2e	1	100.0	252.7	51	263
2021	Apr	16	2	29	6.84	14	16	56.0	20.732253	3.3	5.9	13.6e	1	100.0	253.2	51	264
2021	Apr	21	2	30	13.48	14	22	22.0	20.749503	3.3	5.9	9.0e	0	100.0	254.2	51	264
2021	Apr	26	2	31	20.81	14	27	49.4	20.760018	3.3	5.9	4.4e	0	100.0	256.9	52	264
2021	May	1	2	32	28.52	14	33	16.6	20.763792	3.3	5.9	0.4w	0	100.0	2.9	52	264
2021	May	6	2	33	36.31	14	38	42.1	20.760813	3.3	5.9	4.7w	0	100.0	67.0	52	264
2021	May	11	2	34	43.83	14	44	4.4	20.751078	3.3	5.9	9.3w	0	100.0	69.4	53	264
2021	May	16	2	35	50.74	14	49	21.9	20.734650	3.3	5.9	13.8w	1	100.0	70.3	53	264
2021	May	21	2	36	56.70	14	54	32.8	20.711663	3.3	5.9	18.4w	1	100.0	70.8	53	265
2021	May	26	2	38	1.38	14	59	35.8	20.682310	3.3	5.9	22.9w	1	100.0	71.2	53	265
2021	May	31	2	39	4.49	15	4	29.7	20.646799	3.3	5.9	27.4w	1	100.0	71.4	54	265
2021	Jun	5	2	40	5.75	15	9	13.1	20.605320	3.3	5.9	31.9w	2	100.0	71.6	54	265
2021	Jun	10	2	41	4.82	15	13	44.9	20.558101	3.3	5.9	36.5w	2	100.0	71.8	54	265
2021	Jun	15	2	42	1.39	15	18	3.5	20.505438	3.3	5.9	41.0w	2	100.0	71.9	54	265
2021	Jun	20	2	42	55.17	15	22	7.9	20.447690	3.4	5.8	45.6w	2	100.0	72.1	55	265
2021	Jun	25	2	43	45.89	15	25	57.0	20.385249	3.4	5.8	50.1w	2	100.0	72.2	55	266
2021	Jun	30	2	44	33.31	15	29	29.9	20.318489	3.4	5.8	54.7w	2	100.0	72.3	55	266
2021	Jul	5	2	45	17.18	15	32	45.7	20.247784	3.4	5.8	59.3w	3	100.0	72.4	55	266
2021	Jul	10	2	45	57.24	15	35	43.4	20.173563	3.4	5.8	63.9w	3	99.9	72.5	55	266
2021	Jul	15	2	46	33.25	15	38	22.0	20.096315	3.4	5.8	68.5w	3	99.9	72.5	56	266
2021	Jul	20	2	47	5.00	15	40	40.8	20.016571	3.4	5.8	73.1w	3	99.9	72.6	56	266
2021	Jul	25	2	47	32.35	15	42	39.4	19.934861	3.4	5.8	77.8w	3	99.9	72.7	56	266
2021	Jul	30	2	47	55.15	15	44	17.3	19.851684	3.5	5.8	82.5w	3	99.9	72.7	56	266
2021	Aug	4	2	48	13.25	15	45	34.0	19.767561	3.5	5.8	87.2w	3	99.9	72.8	56	266
2021	Aug	9	2	48	26.52	15	46	28.9	19.683062	3.5	5.8	91.9w	3	99.9	72.9	56	266
2021	Aug	14	2	48	34.87	15	47	1.9	19.598802	3.5	5.8	96.7w	3	99.9	72.9	56	266
2021	Aug	19	2	48	38.29	15	47	12.8	19.515401	3.5	5.7	101.5w	3	99.9	72.9	56	266
2021	Aug	24	2	48	36.78	15	47	2.0	19.433439	3.5	5.7	106.3w	3	99.9	73.0	56	266
2021	Aug	29	2	48	30.38	15	46	29.4	19.353468	3.5	5.7	111.1w	3	99.9	73.0	56	266
2021	Sep	3	2	48	19.13	15	45	35.5	19.276067	3.6	5.7	116.0w	3	99.9	73.0	56	266
2021	Sep	8	2	48	3.13	15	44	20.5	19.201840	3.6	5.7	120.9w	3	100.0	73.1	56	266
2021	Sep	13	2	47	42.54	15	42	45.0	19.131400	3.6	5.7	125.9w	2	100.0	73.1	56	266
2021	Sep	18	2	47	17.57	15	40	50.2	19.065311	3.6	5.7	130.9w	2	100.0	73.1	56	266
2021	Sep	23	2	46	48.49	15	38	37.2	19.004066	3.6	5.7	135.9w	2	100.0	73.2	56	266
2021	Sep	28	2	46	15.56	15	36	6.9	18.948139	3.6	5.7	140.9w	2	100.0	73.2	55	266
2021	Oct	3	2	45	39.09	15	33	20.8	18.898003	3.6	5.7	146.0w	2	100.0	73.3	55	266
2021	Oct	8	2	44	59.44	15	30	20.3	18.854123	3.6	5.7	151.1w	1	100.0	73.4	55	266
2021	Oct	13	2	44	17.03	15	27	7.2	18.816915	3.6	5.7	156.2w	1	100.0	73.5	55	266
2021	Oct	18	2	43	32.33	15	23	43.7	18.786691	3.6	5.7	161.3w	1	100.0	73.8	55	266
2021	Oct	23	2	42	45.82	15	20	11.9	18.763692	3.7	5.7	166.5w	1	100.0	74.2	55	265
2021	Oct	28	2	41	57.95	15	16	33.8	18.748128	3.7	5.7	171.7w	0	100.0	75.3	54	265
2021	Nov	2	2	41	9.23	15	12	51.5	18.740181	3.7	5.7	176.9w	0	100.0	80.1	54	265
2021	Nov	7	2	40	20.19	15	9	7.7	18.739982	3.7	5.6	177.9e	0	100.0	240.9	54	265
2021	Nov	12	2	39	31.40	15	5	24.8	18.747563	3.7	5.7	172.7e	0	100.0	249.0	54	265
2021	Nov	17	2	38	43.41	15	1	45.5	18.762838	3.7	5.7	167.4e	1	100.0	250.3	54	265
2021	Nov	22	2	37	56.72	14	58	12.3	18.785668	3.6	5.7	162.2e	1	100.0	250.8	53	265
2021	Nov	27	2	37	11.83	14	54	47.3	18.815885	3.6	5.7	156.9e	1	100.0	251.1	53	265

2021 Dec 2	2 36 29.22	14 51 32.9	18.853275	3.6	5.7 151.7e	1 100.0	251.3	53 265
2021 Dec 7	2 35 49.39	14 48 31.5	18.897555	3.6	5.7 146.5e	2 100.0	251.4	53 264
2021 Dec 12	2 35 12.79	14 45 45.4	18.948328	3.6	5.7 141.2e	2 100.0	251.4	53 264
2021 Dec 17	2 34 39.81	14 43 16.6	19.005125	3.6	5.7 136.0e	2 100.0	251.5	53 264
2021 Dec 22	2 34 10.79	14 41 6.6	19.067461	3.6	5.7 130.8e	2 100.0	251.5	52 264
2021 Dec 27	2 33 46.03	14 39 16.9	19.134839	3.6	5.7 125.6e	2 100.0	251.6	52 264

Neptune  
Equinox of J2000

Date	Right Asc.	Declination	Distance	dia	mag	Elong	I	%Ill	Limb	De	Pp
year mth d	h m s	o ' "	AU	"		o	o		o	o	o
2021 Jan 1	23 18 14.86	- 5 39 55.9	30.286239	2.4	7.9	67.7e	2	100.0	247.4	-24	322
2021 Jan 6	23 18 36.65	- 5 37 29.4	30.365027	2.4	7.9	62.7e	2	100.0	247.5	-23	322
2021 Jan 11	23 19 1.19	- 5 34 46.0	30.440437	2.4	7.9	57.7e	2	100.0	247.6	-23	322
2021 Jan 16	23 19 28.33	- 5 31 46.6	30.511883	2.4	7.9	52.7e	1	100.0	247.8	-23	322
2021 Jan 21	23 19 57.89	- 5 28 32.3	30.578814	2.4	7.9	47.8e	1	100.0	247.9	-23	322
2021 Jan 26	23 20 29.66	- 5 25 4.5	30.640763	2.4	7.9	42.8e	1	100.0	248.1	-23	322
2021 Jan 31	23 21 3.47	- 5 21 24.4	30.697327	2.4	7.9	37.9e	1	100.0	248.3	-23	322
2021 Feb 5	23 21 39.09	- 5 17 33.4	30.748143	2.4	7.9	33.0e	1	100.0	248.6	-23	322
2021 Feb 10	23 22 16.35	- 5 13 32.8	30.792847	2.4	8.0	28.1e	1	100.0	248.9	-23	322
2021 Feb 15	23 22 55.00	- 5 9 23.9	30.831099	2.4	8.0	23.2e	1	100.0	249.4	-23	322
2021 Feb 20	23 23 34.81	- 5 5 8.5	30.862641	2.4	8.0	18.4e	1	100.0	250.1	-23	321
2021 Feb 25	23 24 15.52	- 5 0 48.0	30.887299	2.4	8.0	13.5e	0	100.0	251.3	-23	321
2021 Mar 2	23 24 56.91	- 4 56 24.0	30.904964	2.4	8.0	8.7e	0	100.0	253.8	-23	321
2021 Mar 7	23 25 38.74	- 4 51 57.9	30.915547	2.4	8.0	4.0e	0	100.0	262.3	-23	321
2021 Mar 12	23 26 20.80	- 4 47 31.2	30.918963	2.4	8.0	1.4w	0	100.0	18.8	-23	321
2021 Mar 17	23 27 2.82	- 4 43 5.4	30.915190	2.4	8.0	5.9w	0	100.0	56.3	-23	321
2021 Mar 22	23 27 44.57	- 4 38 42.3	30.904290	2.4	8.0	10.6w	0	100.0	61.1	-23	321
2021 Mar 27	23 28 25.79	- 4 34 23.3	30.886401	2.4	8.0	15.3w	1	100.0	62.9	-23	321
2021 Apr 1	23 29 6.28	- 4 30 9.8	30.861698	2.4	8.0	20.1w	1	100.0	63.8	-23	321
2021 Apr 6	23 29 45.83	- 4 26 3.1	30.830355	2.4	8.0	24.8w	1	100.0	64.5	-23	321
2021 Apr 11	23 30 24.22	- 4 22 4.6	30.792566	2.4	8.0	29.6w	1	100.0	64.9	-23	321
2021 Apr 16	23 31 1.22	- 4 18 15.7	30.748602	2.4	7.9	34.3w	1	100.0	65.2	-23	320
2021 Apr 21	23 31 36.64	- 4 14 37.8	30.698805	2.4	7.9	39.0w	1	100.0	65.4	-23	320
2021 Apr 26	23 32 10.27	- 4 11 12.0	30.643565	2.4	7.9	43.8w	1	100.0	65.6	-22	320
2021 May 1	23 32 41.96	- 4 7 59.4	30.583278	2.4	7.9	48.5w	1	100.0	65.8	-22	320
2021 May 6	23 33 11.54	- 4 5 0.9	30.518322	2.4	7.9	53.2w	2	100.0	65.9	-22	320
2021 May 11	23 33 38.85	- 4 2 17.6	30.449119	2.4	7.9	57.9w	2	100.0	66.0	-22	320
2021 May 16	23 34 3.73	- 3 59 50.5	30.376159	2.4	7.9	62.6w	2	100.0	66.1	-22	320
2021 May 21	23 34 26.04	- 3 57 40.4	30.299979	2.4	7.9	67.3w	2	100.0	66.3	-22	320
2021 May 26	23 34 45.69	- 3 55 48.0	30.221126	2.4	7.9	72.0w	2	100.0	66.4	-22	320
2021 May 31	23 35 2.58	- 3 54 13.6	30.140121	2.4	7.9	76.8w	2	100.0	66.4	-22	320
2021 Jun 5	23 35 16.63	- 3 52 57.8	30.057476	2.4	7.9	81.5w	2	100.0	66.5	-22	320
2021 Jun 10	23 35 27.76	- 3 52 1.1	29.973756	2.4	7.9	86.2w	2	100.0	66.6	-22	320
2021 Jun 15	23 35 35.91	- 3 51 23.7	29.889566	2.4	7.9	91.0w	2	100.0	66.7	-22	320
2021 Jun 20	23 35 41.05	- 3 51 5.8	29.805526	2.5	7.9	95.7w	2	100.0	66.8	-22	320
2021 Jun 25	23 35 43.19	- 3 51 7.2	29.722227	2.5	7.9	100.5w	2	100.0	66.9	-22	320
2021 Jun 30	23 35 42.35	- 3 51 27.7	29.640212	2.5	7.9	105.3w	2	100.0	67.0	-22	320
2021 Jul 5	23 35 38.54	- 3 52 7.0	29.560037	2.5	7.9	110.0w	2	100.0	67.1	-22	320
2021 Jul 10	23 35 31.81	- 3 53 5.0	29.482289	2.5	7.9	114.8w	2	100.0	67.2	-22	320
2021 Jul 15	23 35 22.23	- 3 54 21.0	29.407566	2.5	7.9	119.6w	2	100.0	67.4	-22	320
2021 Jul 20	23 35 9.90	- 3 55 54.2	29.336435	2.5	7.8	124.5w	2	100.0	67.5	-22	320
2021 Jul 25	23 34 54.96	- 3 57 43.6	29.269398	2.5	7.8	129.3w	2	100.0	67.6	-22	320
2021 Jul 30	23 34 37.54	- 3 59 48.3	29.206915	2.5	7.8	134.2w	1	100.0	67.8	-22	320
2021 Aug 4	23 34 17.79	- 4 2 7.3	29.149454	2.5	7.8	139.0w	1	100.0	68.0	-22	320
2021 Aug 9	23 33 55.88	- 4 4 39.3	29.097488	2.5	7.8	143.9w	1	100.0	68.3	-22	320
2021 Aug 14	23 33 32.02	- 4 7 23.0	29.051457	2.5	7.8	148.8w	1	100.0	68.6	-22	320
2021 Aug 19	23 33 6.45	- 4 10 16.7	29.011725	2.5	7.8	153.8w	1	100.0	69.1	-22	320
2021 Aug 24	23 32 39.40	- 4 13 18.8	28.978574	2.5	7.8	158.7w	1	100.0	69.7	-22	320
2021 Aug 29	23 32 11.13	- 4 16 27.7	28.952256	2.5	7.8	163.6w	1	100.0	70.7	-22	320
2021 Sep 3	23 31 41.87	- 4 19 41.6	28.933017	2.5	7.8	168.6w	0	100.0	72.5	-22	320
2021 Sep 8	23 31 11.91	- 4 22 58.9	28.921068	2.5	7.8	173.5w	0	100.0	77.1	-23	320
2021 Sep 13	23 30 41.55	- 4 26 17.6	28.916550	2.5	7.8	178.2w	0	100.0	107.1	-23	321
2021 Sep 18	23 30 11.09	- 4 29 35.6	28.919498	2.5	7.8	176.2e	0	100.0	228.9	-23	321
2021 Sep 23	23 29 40.83	- 4 32 51.0	28.929878	2.5	7.8	171.3e	0	100.0	239.1	-23	321
2021 Sep 28	23 29 11.04	- 4 36 2.2	28.947638	2.5	7.8	166.3e	0	100.0	242.0	-23	321

2021 Oct 3	23 28	42.01	- 4 39	7.3	28.972698	2.5	7.8	161.2e	1	100.0	243.3	-23	321
2021 Oct 8	23 28	14.03	- 4 42	4.4	29.004920	2.5	7.8	156.2e	1	100.0	244.1	-23	321
2021 Oct 13	23 27	47.42	- 4 44	51.6	29.044068	2.5	7.8	151.1e	1	100.0	244.7	-23	321
2021 Oct 18	23 27	22.43	- 4 47	27.4	29.089813	2.5	7.8	146.1e	1	100.0	245.1	-23	321
2021 Oct 23	23 26	59.30	- 4 49	50.1	29.141796	2.5	7.8	141.0e	1	100.0	245.4	-23	321
2021 Oct 28	23 26	38.26	- 4 51	58.5	29.199646	2.5	7.8	135.9e	1	100.0	245.6	-23	321
2021 Nov 2	23 26	19.54	- 4 53	51.3	29.262957	2.5	7.8	130.8e	1	100.0	245.8	-23	321
2021 Nov 7	23 26	3.34	- 4 55	27.2	29.331262	2.5	7.8	125.8e	2	100.0	246.0	-23	321
2021 Nov 12	23 25	49.85	- 4 56	45.0	29.404001	2.5	7.9	120.7e	2	100.0	246.1	-23	321
2021 Nov 17	23 25	39.21	- 4 57	44.0	29.480572	2.5	7.9	115.6e	2	100.0	246.3	-23	321
2021 Nov 22	23 25	31.54	- 4 58	23.7	29.560390	2.5	7.9	110.5e	2	100.0	246.4	-23	321
2021 Nov 27	23 25	26.92	- 4 58	43.4	29.642867	2.5	7.9	105.5e	2	100.0	246.5	-23	321
2021 Dec 2	23 25	25.44	- 4 58	42.8	29.727394	2.5	7.9	100.4e	2	100.0	246.6	-23	321
2021 Dec 7	23 25	27.16	- 4 58	21.6	29.813309	2.5	7.9	95.3e	2	100.0	246.7	-23	321
2021 Dec 12	23 25	32.10	- 4 57	39.8	29.899904	2.4	7.9	90.3e	2	100.0	246.8	-23	321
2021 Dec 17	23 25	40.24	- 4 56	37.6	29.986498	2.4	7.9	85.2e	2	100.0	246.9	-23	321
2021 Dec 22	23 25	51.53	- 4 55	15.4	30.072455	2.4	7.9	80.2e	2	100.0	247.0	-23	321
2021 Dec 27	23 26	5.91	- 4 53	33.6	30.157155	2.4	7.9	75.2e	2	100.0	247.1	-23	321