2012 Sun and Planets

Date	SUN GHA °	'	d '	Dec °	'	d '	Mercury vis	mag	GHA °	'	d '	dd '	Dec °	'	d '	dd '	Venus vis	mag	GHA °	'	d '	Dec °	'	d '
Jan 1	179	13.9	-7.1	-23	3.8	4.8	sr	-0.4	201	2.9	-27.3	0.8	-22	7.9	-14.0	-0.4	ss	-4.0	143	13.3	-14.8	-18	25.8	22.0
2	179	6.8	-7.0	-22	59.0	5.3	sr	-0.4	200	35.5	-28.8	0.8	-22	21.9	-13.2	-0.4	ss	-4.0	142	58.5	-14.4	-18	3.8	22.5
3	178	59.8	-6.9	-22	53.7	5.7	sr	-0.4	200	6.7	-30.2	0.7	-22	35.1	-12.3	-0.4	ss	-4.0	142	44.1	-14.0	-17	41.3	23.0
4	178	52.9	-6.8	-22	48.0	6.2	sr	-0.4	199	36.5	-31.5	0.6	-22	47.4	-11.4	-0.5	ss	-4.0	142	30.0	-13.7	-17	18.3	23.4
5	178	46.0	-6.7	-22	41.8	6.6	sr	-0.4	199	5.0	-32.7	0.6	-22	58.8	-10.4	-0.5	ss	-4.0	142	16.3	-13.3	-16	54.9	23.9
6	178	39.3	-6.6	-22	35.2	7.0	sr	-0.4	198	32.3	-33.8	0.5	-23	9.2	-9.5	-0.5	ss	-4.0	142	3.0	-13.0	-16	31.0	24.3
7	178	32.7	-6.5	-22	28.2	7.5	sr	-0.4	197	58.5	-34.8	0.5	-23	18.7	-8.3	-0.6	ss	-4.0	141	50.1	-12.6	-16	6.7	24.8
8	178	26.2	-6.4	-22	20.7	8.0	sr	-0.4	197	23.7	-35.7	0.5	-23	27.0	-7.3	-0.5	ss	-4.0	141	37.5	-12.2	-15	41.9	25.1
9	178	19.9	-6.2	-22	12.7	8.4	sr	-0.4	196	48.0	-36.6	0.4	-23	34.3	-6.2	-0.5	ss	-4.0	141	25.2	-11.9	-15	16.8	25.6
10	178	13.6	-6.1	-22	4.3	8.8	sr	-0.4	196	11.4	-37.4	0.4	-23	40.5	-5.0	-0.6	ss	-4.0	141	13.3	-11.5	-14	51.2	25.9
11	178	7.5	-6.0	-21	55.5	9.2	sr	-0.4	195	34.1	-38.1	0.4	-23	45.5	-3.9	-0.5	ss	-4.0	141	1.8	-11.2	-14	25.3	26.3
12	178	1.6	-5.8	-21	46.3	9.7	sr	-0.4	194	56.0	-38.8	0.3	-23	49.4	-2.6	-0.7	ss	-4.0	140	50.6	-10.9	-13	59.0	26.7
13	177	55.8	-5.7	-21	36.6	10.1	sr	-0.4	194	17.2	-39.5	0.3	-23	52.0	-1.4	-0.6	ss	-4.0	140	39.8	-10.5	-13	32.3	27.0
14	177	50.1	-5.5	-21	26.5	10.4	sr	-0.4	193	37.7	-40.0	0.3	-23	53.4	-0.1	-0.7	ss	-4.0	140	29.3	-10.2	-13	5.3	27.3
15	177	44.6	-5.3	-21	16.1	11.0	sr	-0.4	192	57.7	-40.6	0.3	-23	53.5	1.1	-0.6	ss	-4.0	140	19.1	-9.9	-12	38.0	27.7
16	177	39.3	-5.2	-21	5.1	11.3	sr	-0.5	192	17.1	-41.1	0.3	-23	52.4	2.4	-0.7	ss	-4.0	140	9.2	-9.6	-12	10.3	28.0
17	177	34.1	-5.0	-20	53.8	11.7	sr	-0.5	191	35.9	-41.6	0.2	-23	50.0	3.7	-0.7	ss	-4.0	139	59.6	-9.2	-11	42.3	28.2
18	177	29.1	-4.8	-20	42.1	12.1	sr	-0.5	190	54.3	-42.0	0.2	-23	46.3	5.1	-0.7	ss	-4.0	139	50.4	-8.9	-11	14.1	28.5
19	177	24.2	-4.7	-20	30.0	12.5	sr	-0.5	190	12.3	-42.4	0.2	-23	41.2	6.4	-0.7	ss	-4.1	139	41.4	-8.7	-10	45.6	28.9
20	177	19.6	-4.5	-20	17.5	12.9	sr	-0.6	189	29.8	-42.8	0.2	-23	34.8	7.8	-0.7	ss	-4.1	139	32.8	-8.4	-10	16.7	29.0
21	177	15.1	-4.3	-20	4.6	13.2	sr	-0.6	188	47.0	-43.2	0.2	-23	27.0	9.1	-0.7	ss	-4.1	139	24.4	-8.1	-9	47.7	29.3
22	177	10.8	-4.1	-19	51.4	13.6	sr	-0.6	188	3.9	-43.5	0.2	-23	17.9	10.5	-0.7	ss	-4.1	139	16.3	-7.8	-9	18.4	29.5
23	177	6.7	-3.9	-19	37.8	14.0	sr	-0.6	187	20.4	-43.8	0.1	-23	7.4	12.0	-0.8	ss	-4.1	139	8.5	-7.5	-8	48.9	29.8
24	177	2.8	-3.7	-19	23.8	14.4	sr	-0.7	186	36.6	-44.0	0.1	-22	55.4	13.3	-0.7	ss	-4.1	139	1.0	-7.3	-8	19.1	29.9
25	176	59.0	-3.5	-19	9.4	14.7	sr	-0.7	185	52.6	-44.3	0.1	-22	42.1	14.8	-0.8	ss	-4.1	138	53.7	-7.0	-7	49.2	30.2
26	176	55.5	-3.3	-18	54.7	15.0	sr	-0.8	185	8.3	-44.5	0.1	-22	27.3	16.1	-0.6	ss	-4.1	138	46.7	-6.8	-7	19.0	30.3
27	176	52.2	-3.1	-18	39.7	15.4	sr	-0.8	184	23.9	-44.7	0.1	-22	11.2	17.7	-0.8	ss	-4.1	138	39.9	-6.5	-6	48.7	30.4
28	176	49.1	-2.9	-18	24.3	15.7		-0.8	183	39.2	-44.8	0.1	-21	53.5	19.0	-0.7	ss	-4.1	138	33.3	-6.3	-6	18.3	30.7
29	176	46.1	-2.7	-18	8.6	16.0		-0.9	182	54.4	-45.0	0.1	-21	34.5	20.6	-0.8	ss	-4.1	138	27.0	-6.1	-5	47.6	30.7
30	176	43.4	-2.5	-17	52.6	16.4		-0.9	182	9.4	-45.1	0.1	-21	13.9	21.9	-0.7	ss	-4.1	138	20.9	-5.9	-5	16.9	30.9
Jan 31	176	40.9	-2.3	-17	36.2	16.7		-1.0	181	24.3	-45.2	0.1	-20	52.0	23.5	-0.8	ss	-4.1	138	15.0	-5.7	-4	46.0	31.0
Feb 1	176	38.7	-2.1	-17	19.5	16.9		-1.1	180	39.1	-45.3	0.0	-20	28.5	24.9	-0.7	ss	-4.1	138	9.4	-5.5	-4	15.0	31.1
2	176	36.6	-1.9	-17	2.6	17.3		-1.1	179	53.7	-45.4	0.0	-20	3.6	26.4	-0.8	ss	-4.1	138	3.9	-5.3	-3	43.9	31.2
3	176	34.7	-1.7	-16	45.3	17.6		-1.2	179	8.3	-45.5	0.0	-19	37.2	27.9	-0.8	ss	-4.1	137	58.6	-5.1	-3	12.7	31.2
4	176	33.0	-1.5	-16	27.7	17.8		-1.3	178	22.9	-45.5	0.0	-19	9.3	29.3	-0.7	ss	-4.1	137	53.6	-4.9	-2	41.5	31.3
5	176	31.6	-1.3	-16	9.9	18.1		-1.3	177	37.4	-45.5	0.0	-18	40.0	30.9	-0.8	ss	-4.1	137	48.7	-4.7	-2	10.2	31.4
6	176	30.3	-1.1	-15	51.8	18.4		-1.4	176	51.8	-45.5	0.0	-18	9.1	32.3	-0.7	ss	-4.1	137	43.9	-4.6	-1	38.8	31.4
7	176	29.3	-0.8	-15	33.4	18.7		-1.4	176	6.3	-45.5	0.0	-17	36.8	33.8	-0.8	ss	-4.1	137	39.3	-4.4	-1	7.4	31.4
8	176	28.4	-0.6	-15	14.7	18.9		-1.5	175	20.7	-45.5	0.0	-17	3.0	35.2	-0.7	ss	-4.1	137	34.9	-4.3	-0	36.0	31.5
9	176	27.8	-0.5	-14	55.8	19.2		-1.5	174	35.3	-45.4	0.0	-16	27.8	36.7	-0.8	ss	-4.1	137	30.7	-4.1	-0	4.5	31.4
10	176	27.3	-0.3	-14	36.6	19.4		-1.5	173	49.8	-45.3	-0.1	-15	51.1	38.1	-0.7	ss	-4.1	137	26.5	-4.0	0	26.9	31.5
11	176	27.1	-0.1	-14	17.2	19.7		-1.5	173	4.5	-45.2	-0.1	-15	13.0	39.6	-0.8	ss	-4.1	137	22.5	-3.9	0	58.4	31.4
12	176	27.0	0.1	-13	57.5	19.8		-1.4	172	19.3	-45.0	-0.1	-14	33.4	40.9	-0.6	ss	-4.1	137	18.6	-3.8	1	29.8	31.4
13	176	27.1	0.3	-13	37.7	20.2		-1.4	171	34.3	-44.8	-0.1	-13	52.5	42.3	-0.7	ss	-4.1	137	14.9	-3.7	2	1.2	31.4
14	176	27.4	0.5	-13	17.5	20.3		-1.4	170	49.6	-44.5	-0.2	-13	10.2	43.6	-0.7	ss	-4.1	137	11.2	-3.6	2	32.6	31.3
15	176	27.9	0.7	-12	57.2	20.5		-1.4	170	5.1	-44.1	-0.2	-12	26.6	44.9	-0.6	ss	-4.2	137	7.6	-3.5	3	3.9	31.2
16	176	28.5	0.8	-12	36.7	20.8		-1.4	169	21.0	-43.6	-0.2	-11	41.7	46.1	-0.6	ss	-4.2	137	4.1	-3.4	3	35.1	31.2
17	176	29.4	1.0	-12	15.9	20.9	ss	-1.3	168	37.4	-43.0	-0.3	-10	55.6	47.2	-0.6	ss	-4.2	137	0.7	-3.3	4	6.3	31.0
18	176	30.4	1.2	-11	55.0	21.2	ss	-1.3	167	54.4	-42.3	-0.4	-10	8.4	48.2	-0.5	ss	-4.2	136	57.4	-3.3	4	37.3	31.0
19	176	31.6	1.3	-11	33.8	21.3	ss	-1.3	167	12.1	-41.4	-0.4	-9	20.2	49.2	-0.5	ss	-4.2	136	54.2	-3.2	5	8.3	30.9
20	176	32.9	1.5	-11	12.5	21.5	ss	-1.3	166	30.7	-40.3	-0.5	-8	31.0	49.9	-0.3	ss	-4.2	136	51.0	-3.1	5	39.2	30.7
21	176	34.4	1.7	-10	51.0	21.7	ss	-1.2	165	50.4	-39.0	-0.6	-7	41.1	50.6	-0.4	ss	-4.2	136	47.9	-3.1	6	9.9	30.7
22	176	36.1	1.8	-10	29.3	21.8	ss	-1.2	165	11.3	-37.5	-0.8	-6	50.5	51.2	-0.3	ss	-4.2	136	44.8	-3.0	6	40.6	30.4
23	176	37.9	2.0	-10	7.5	22.0	ss	-1.2	164	33.8	-35.7	-0.9	-5	59.3	51.3	-0.1	ss	-4.2	136	41.7	-3.0	7	11.0	30.3
24	176	39.9	2.1	-9	45.5	22.1	ss	-1.2	163	58.1	-33.5	-1.1	-5	8.0	51.5	-0.1	ss	-4.2	136	38.8	-2.9	7	41.3	30.2
25	176	42.0	2.3	-9	23.4	22.3	ss	-1.1	163	24.6	-31.1	-1.2	-4	16.5	51.3	0.1	ss	-4.2	136	35.8	-2.9	8	11.5	30.0
26	176	44.3	2.4	-9	1.1	22.4	ss	-1.1	162	53.5	-28.2	-1.4	-3	25.2	50.9	0.2	ss	-4.2	136	32.9	-2.9	8	41.5	29.7
27	176	46.8	2.6	-8	38.7	22.5	ss	-1.0	162	25.4	-24.9	-1.7	-2	34.3	50.1	0.4	ss	-4.2	136	30.0	-2.8	9	11.2	29.6
28	176	49.4	2.7	-8	16.2	22.7	ss	-1.0	162	0.5	-21.1	-1.9	-1	44.2	49.1	0.5	ss	-4.2	136	27.2	-2.8	9	40.8	29.4
Feb 29	176	52.1	2.9	-7	53.5	22.7	ss	-0.9	161	39.4	-16.9	-2.1	-0	55.1	47.8	0.6	ss	-4.2	136	24.4	-2.8	10	10.2	29.1
Mar 1	176	54.9	3.0	-7	30.8	22.9	ss	-0.8	161	22.6	-12.1	-2.4	-0	7.3	46.0	0.9	ss	-4.2	136	21.6	-2.8	10	39.3	29.0
2	176	57.9	3.1	-7	7.9	23.0	ss	-0.7	161	10.4	-6.9	-2.6	0	38.7	44.0	1.0	ss	-4.2	136	18.9	-2.7	11	8.3	28.6
3	177	1.0	3.2	-6	44.9	23.0	ss	-0.6	161	3.5	-1.3	-2.8	1	22.7	41.6	1.2	ss	-4.2	136	16.1	-2.7	11	36.9	28.4
4	177	4.3	3.3	-6	21.9	23.2	ss	-0.5	161	2.2	4.9	-3.1	2	4.3	38.9	1.4	ss	-4.2	136	13.4	-2.7	12	5.3	28.2
Mar 5	177	7.6	3.5	-5	58.7	23.2	ss	-0.4	161	7.1	11.4	-3.3	2	43.2	35.9	1.5	ss	-4.2	136	10.7	-2.7	12	33.5	27.9

2012 Sun and Planets

Date	Mars vis	mag	GHA °	'	d '	Dec °	'	d '	Jupiter vis	mag	GHA °	'	d '	Dec °	'	d '	Saturn vis	mag	GHA °	'	d '	Dec °	'	d '
Jan 1	y	0.2	287	59.3	45.3	6	37.2	-4.1	y	-2.6	71	18.4	57.9	10	28.2	0.7	y	1.3	252	54.7	55.5	-8	36.2	-1.1
2	y	0.2	288	44.6	45.8	6	33.1	-3.9	y	-2.6	72	16.3	57.7	10	28.9	0.9	y	1.3	253	50.3	55.6	-8	37.3	-1.0
3	y	0.2	289	30.4	46.3	6	29.2	-3.7	y	-2.6	73	14.1	57.5	10	29.8	0.9	y	1.3	254	45.9	55.7	-8	38.3	-1.1
4	y	0.1	290	16.7	46.8	6	25.5	-3.4	y	-2.6	74	11.6	57.3	10	30.7	1.0	y	1.3	255	41.6	55.8	-8	39.4	-1.0
5	y	0.1	291	3.4	47.3	6	22.1	-3.3	y	-2.6	75	9.0	57.2	10	31.7	1.0	y	1.3	256	37.3	55.9	-8	40.4	-0.9
6	y	0.1	291	50.7	47.8	6	18.8	-3.0	y	-2.5	76	6.1	57.0	10	32.7	1.1	y	1.3	257	33.2	56.0	-8	41.3	-0.9
7	y	0.1	292	38.5	48.3	6	15.8	-2.8	y	-2.5	77	3.1	56.8	10	33.8	1.2	y	1.3	258	29.2	56.0	-8	42.2	-0.9
8	y	0.1	293	26.7	48.8	6	13.0	-2.5	y	-2.5	77	59.9	56.6	10	35.0	1.3	y	1.3	259	25.2	56.1	-8	43.1	-0.9
9	y	0.0	294	15.6	49.4	6	10.5	-2.4	y	-2.5	78	56.4	56.4	10	36.3	1.3	y	1.3	260	21.3	56.2	-8	44.0	-0.8
10	y	0.0	295	4.9	49.9	6	8.1	-2.0	y	-2.5	79	52.8	56.2	10	37.6	1.4	y	1.3	261	17.6	56.3	-8	44.8	-0.8
11	y	0.0	295	54.8	50.5	6	6.1	-1.8	y	-2.5	80	49.0	56.0	10	39.0	1.5	y	1.3	262	13.9	56.4	-8	45.6	-0.7
12	y	0.0	296	45.3	51.0	6	4.3	-1.6	y	-2.5	81	45.0	55.8	10	40.5	1.5	y	1.3	263	10.3	56.5	-8	46.3	-0.8
13	y	-0.1	297	36.3	51.6	6	2.7	-1.3	y	-2.5	82	40.9	55.6	10	42.0	1.6	y	1.3	264	6.7	56.6	-8	47.1	-0.6
14	y	-0.1	298	27.9	52.2	6	1.4	-1.1	y	-2.5	83	36.5	55.5	10	43.6	1.6	y	1.3	265	3.3	56.7	-8	47.7	-0.7
15	y	-0.1	299	20.1	52.8	6	0.3	-0.8	y	-2.5	84	32.0	55.3	10	45.2	1.8	y	1.3	266	0.0	56.8	-8	48.4	-0.6
16	y	-0.1	300	13.0	53.4	5	59.5	-0.5	y	-2.5	85	27.3	55.1	10	47.0	1.7	y	1.3	266	56.8	56.9	-8	49.0	-0.5
17	y	-0.2	301	6.4	54.1	5	59.0	-0.3	y	-2.5	86	22.4	54.9	10	48.7	1.9	y	1.2	267	53.6	57.0	-8	49.5	-0.6
18	y	-0.2	302	0.5	54.7	5	58.7	0.0	y	-2.5	87	17.3	54.7	10	50.6	1.9	y	1.2	268	50.6	57.0	-8	50.1	-0.5
19	y	-0.2	302	55.2	55.4	5	58.7	0.3	y	-2.4	88	12.0	54.6	10	52.5	2.0	y	1.2	269	47.6	57.1	-8	50.6	-0.4
20	y	-0.2	303	50.5	56.0	5	59.0	0.6	y	-2.4	89	6.6	54.4	10	54.5	2.0	y	1.2	270	44.8	57.2	-8	51.0	-0.5
21	y	-0.3	304	46.6	56.7	5	59.6	0.9	y	-2.4	90	1.0	54.2	10	56.5	2.1	y	1.2	271	42.0	57.3	-8	51.5	-0.3
22	y	-0.3	305	43.3	57.4	6	0.5	1.1	y	-2.4	90	55.2	54.0	10	58.6	2.1	y	1.2	272	39.4	57.4	-8	51.8	-0.4
23	y	-0.3	306	40.6	58.1	6	1.6	1.5	y	-2.4	91	49.2	53.9	11	0.7	2.2	y	1.2	273	36.8	57.5	-8	52.2	-0.3
24	y	-0.3	307	38.7	58.8	6	3.1	1.7	y	-2.4	92	43.1	53.7	11	2.9	2.3	y	1.2	274	34.3	57.6	-8	52.5	-0.3
25	y	-0.4	308	37.5	59.5	6	4.8	2.0	y	-2.4	93	36.8	53.5	11	5.2	2.3	y	1.2	275	32.0	57.7	-8	52.8	-0.2
26	y	-0.4	309	37.0	60.2	6	6.8	2.3	y	-2.4	94	30.3	53.4	11	7.5	2.4	y	1.2	276	29.7	57.8	-8	53.0	-0.2
27	y	-0.4	310	37.1	60.9	6	9.1	2.6	y	-2.4	95	23.7	53.2	11	9.9	2.4	y	1.2	277	27.5	57.9	-8	53.2	-0.2
28	y	-0.5	311	38.0	61.6	6	11.7	2.9	y	-2.4	96	16.9	53.0	11	12.3	2.5	y	1.2	278	25.5	58.0	-8	53.4	-0.1
29	y	-0.5	312	39.7	62.4	6	14.6	3.2	y	-2.4	97	9.9	52.9	11	14.8	2.5	y	1.2	279	23.5	58.1	-8	53.5	-0.1
30	y	-0.5	313	42.0	63.1	6	17.8	3.5	y	-2.4	98	2.8	52.7	11	17.3	2.6	y	1.2	280	21.6	58.2	-8	53.6	0.0
Jan 31	y	-0.5	314	45.1	63.8	6	21.3	3.8	y	-2.4	98	55.5	52.6	11	19.9	2.6	y	1.2	281	19.9	58.3	-8	53.6	0.0
Feb 1	y	-0.6	315	48.9	64.6	6	25.1	4.0	y	-2.4	99	48.1	52.4	11	22.5	2.7	y	1.2	282	18.2	58.4	-8	53.6	0.0
2	y	-0.6	316	53.5	65.3	6	29.1	4.3	y	-2.3	100	40.5	52.2	11	25.2	2.8	y	1.2	283	16.6	58.5	-8	53.6	0.1
3	y	-0.6	317	58.8	66.0	6	33.4	4.6	y	-2.3	101	32.7	52.1	11	28.0	2.7	y	1.2	284	15.2	58.6	-8	53.5	0.1
4	y	-0.6	319	4.8	66.8	6	38.0	4.9	y	-2.3	102	24.8	51.9	11	30.7	2.9	y	1.2	285	13.8	58.7	-8	53.4	0.1
5	y	-0.7	320	11.6	67.5	6	42.9	5.2	y	-2.3	103	16.7	51.8	11	33.6	2.8	y	1.2	286	12.5	58.8	-8	53.3	0.2
6	y	-0.7	321	19.1	68.3	6	48.1	5.4	y	-2.3	104	8.5	51.6	11	36.4	3.0	y	1.2	287	11.4	58.9	-8	53.1	0.2
7	y	-0.7	322	27.4	69.0	6	53.5	5.7	y	-2.3	105	0.2	51.5	11	39.4	2.9	y	1.2	288	10.3	59.0	-8	52.9	0.2
8	y	-0.7	323	36.4	69.7	6	59.2	6.0	y	-2.3	105	51.7	51.4	11	42.3	3.0	y	1.2	289	9.3	59.1	-8	52.7	0.3
9	y	-0.8	324	46.1	70.4	7	5.2	6.2	y	-2.3	106	43.0	51.2	11	45.3	3.1	y	1.1	290	8.5	59.2	-8	52.4	0.3
10	y	-0.8	325	56.5	71.2	7	11.4	6.5	y	-2.3	107	34.3	51.1	11	48.4	3.1	y	1.1	291	7.7	59.3	-8	52.1	0.4
11	y	-0.8	327	7.7	71.9	7	17.9	6.7	y	-2.3	108	25.3	50.9	11	51.5	3.1	y	1.1	292	7.1	59.4	-8	51.7	0.4
12	y	-0.8	328	19.6	72.6	7	24.6	6.9	y	-2.3	109	16.3	50.8	11	54.6	3.2	y	1.1	293	6.5	59.5	-8	51.3	0.4
13	y	-0.9	329	32.2	73.3	7	31.5	7.1	y	-2.3	110	7.1	50.7	11	57.8	3.2	y	1.1	294	6.0	59.6	-8	50.9	0.5
14	y	-0.9	330	45.5	74.0	7	38.6	7.4	y	-2.3	110	57.8	50.5	12	1.0	3.2	y	1.1	295	5.7	59.7	-8	50.4	0.5
15	y	-0.9	331	59.4	74.6	7	46.0	7.6	y	-2.3	111	48.3	50.4	12	4.2	3.3	y	1.1	296	5.4	59.8	-8	49.9	0.5
16	y	-0.9	333	14.0	75.3	7	53.6	7.7	y	-2.3	112	38.7	50.3	12	7.5	3.4	y	1.1	297	5.2	59.9	-8	49.4	0.5
17	y	-1.0	334	29.3	75.9	8	1.3	7.9	y	-2.3	113	29.0	50.1	12	10.9	3.3	y	1.1	298	5.2	60.0	-8	48.9	0.6
18	y	-1.0	335	45.2	76.5	8	9.2	8.1	y	-2.2	114	19.1	50.0	12	14.2	3.4	y	1.1	299	5.2	60.1	-8	48.3	0.7
19	y	-1.0	337	1.7	77.1	8	17.3	8.3	y	-2.2	115	9.2	49.9	12	17.6	3.4	y	1.1	300	5.3	60.2	-8	47.6	0.7
20	y	-1.0	338	18.8	77.6	8	25.6	8.3	y	-2.2	115	59.1	49.8	12	21.0	3.5	y	1.1	301	5.5	60.3	-8	46.9	0.7
21	y	-1.0	339	36.4	78.2	8	33.9	8.5	y	-2.2	116	48.8	49.7	12	24.5	3.5	y	1.1	302	5.9	60.4	-8	46.2	0.7
22	y	-1.1	340	54.6	78.7	8	42.4	8.6	y	-2.2	117	38.5	49.5	12	28.0	3.5	y	1.1	303	6.3	60.5	-8	45.5	0.8
23	y	-1.1	342	13.2	79.1	8	51.0	8.6	y	-2.2	118	28.0	49.4	12	31.5	3.6	y	1.1	304	6.8	60.6	-8	44.7	0.8
24	y	-1.1	343	32.3	79.5	8	59.6	8.8	y	-2.2	119	17.4	49.3	12	35.1	3.5	y	1.1	305	7.4	60.7	-8	43.9	0.8
25	y	-1.1	344	51.9	79.9	9	8.4	8.7	y	-2.2	120	6.7	49.2	12	38.6	3.7	y	1.1	306	8.1	60.8	-8	43.1	0.9
26	y	-1.1	346	11.8	80.3	9	17.1	8.8	y	-2.2	120	55.9	49.1	12	42.3	3.6	y	1.1	307	8.9	60.9	-8	42.2	0.9
27	y	-1.2	347	32.1	80.6	9	25.9	8.8	y	-2.2	121	45.0	49.0	12	45.9	3.7	y	1.0	308	9.8	61.0	-8	41.3	0.9
28	y	-1.2	348	52.7	80.9	9	34.7	8.8	y	-2.2	122	33.9	48.8	12	49.6	3.6	y	1.0	309	10.8	61.1	-8	40.4	1.0
Feb 29	y	-1.2	350	13.6	81.1	9	43.5	8.7	y	-2.2	123	22.8	48.7	12	53.2	3.8	y	1.0	310	11.9	61.2	-8	39.4	1.0
Mar 1	y	-1.2	351	34.7	81.3	9	52.2	8.7	y	-2.2	124	11.5	48.6	12	57.0	3.7	y	1.0	311	13.0	61.2	-8	38.4	1.0
2	y	-1.2	352	56.0	81.5	10	0.9	8.6	y	-2.2	125	0.2	48.5	13	0.7	3.8	y	1.0	312	14.3	61.3	-8	37.4	1.0
3	y	-1.2	354	17.5	81.6	10	9.5	8.6	y	-2.2	125	48.7	48.4	13	4.5	3.8	y	1.0	313	15.6	61.4	-8	36.4	1.1
4	y	-1.2	355	39.0	81.6	10	18.1	8.4	y	-2.2	126	37.1	48.3	13	8.3	3.8	y	1.0	314	17.0	61.5	-8	35.3	1.1
Mar 5	y	-1.2	357	0.7	81.7	10	26.5	8.4	y	-2.2	127	25.4	48.2	13	12.1	3.8	y	1.0	315	18.5	61.6	-8	34.2	1.1

2012 Sun and Planets

Date	SUN GHA °	'	d '	Dec °	'	d '	Mercury vis	mag	GHA °	'	d '	dd '	Dec °	'	d '	dd '	Venus vis	mag	GHA °	'	d '	Dec °	'	d '
Mar 6	177	11.1	3.6	-5	35.5	23.3	ss	-0.2	161	18.5	18.4	-3.5	3	19.1	32.4	1.8	ss	-4.2	136	8.1	-2.6	13	1.4	27.6
7	177	14.6	3.7	-5	12.2	23.4	ss	-0.1	161	36.9	25.7	-3.6	3	51.5	28.8	1.8	ss	-4.2	136	5.5	-2.6	13	29.0	27.2
8	177	18.3	3.8	-4	48.8	23.4	ss	0.2	162	2.6	33.2	-3.8	4	20.3	24.9	1.9	ss	-4.3	136	2.9	-2.6	13	56.2	27.0
9	177	22.1	3.8	-4	25.4	23.5	ss	0.4	162	35.8	40.9	-3.8	4	45.2	20.6	2.1	ss	-4.3	136	0.3	-2.5	14	23.2	26.7
10	177	25.9	3.9	-4	1.9	23.5	ss	0.6	163	16.6	48.6	-3.9	5	5.8	16.4	2.1	ss	-4.3	135	57.7	-2.5	14	49.9	26.3
11	177	29.8	4.0	-3	38.4	23.6	ss	0.9	164	5.2	56.3	-3.9	5	22.2	11.7	2.3	ss	-4.3	135	55.2	-2.5	15	16.2	26.0
12	177	33.8	4.1	-3	14.8	23.7	ss	1.1	165	1.6	63.9	-3.8	5	33.9	7.2	2.3	ss	-4.3	135	52.8	-2.4	15	42.2	25.7
13	177	37.9	4.1	-2	51.1	23.6	ss	1.4	166	5.4	71.2	-3.6	5	41.1	2.5	2.4	ss	-4.3	135	50.3	-2.4	16	7.9	25.3
14	177	42.0	4.2	-2	27.5	23.7	ss	1.6	167	16.6	78.1	-3.4	5	43.6	-2.2	2.4	ss	-4.3	135	47.9	-2.4	16	33.2	25.0
15	177	46.2	4.2	-2	3.8	23.7	ss	1.9	168	34.7	84.4	-3.2	5	41.4	-6.8	2.3	ss	-4.3	135	45.6	-2.3	16	58.2	24.5
16	177	50.4	4.3	-1	40.1	23.7	ss	2.1	169	59.1	90.1	-2.8	5	34.6	-11.3	2.3	ss	-4.3	135	43.2	-2.3	17	22.7	24.2
17	177	54.7	4.3	-1	16.4	23.8		2.4	171	29.2	95.0	-2.5	5	23.3	-15.3	2.0	ss	-4.3	135	41.0	-2.2	17	46.9	23.8
18	177	59.1	4.4	-0	52.6	23.7		2.6	173	4.2	99.0	-2.0	5	8.0	-19.3	2.0	ss	-4.3	135	38.8	-2.1	18	10.7	23.5
19	178	3.4	4.4	-0	28.9	23.7		2.9	174	43.2	102.1	-1.5	4	48.7	-22.6	1.6	ss	-4.3	135	36.7	-2.0	18	34.2	23.0
20	178	7.8	4.4	-0	5.2	23.7		3.1	176	25.3	104.1	-1.0	4	26.1	-25.6	1.5	ss	-4.3	135	34.6	-2.0	18	57.2	22.6
21	178	12.3	4.5	0	18.5	23.7		3.0	178	9.5	105.2	-0.5	4	0.5	-28.1	1.3	ss	-4.3	135	32.7	-1.9	19	19.8	22.1
22	178	16.7	4.5	0	42.2	23.7		2.9	179	54.6	105.2	0.0	3	32.4	-29.8	0.8	ss	-4.3	135	30.8	-1.7	19	41.9	21.8
23	178	21.2	4.5	1	5.9	23.7		2.8	181	39.8	104.2	0.5	3	2.6	-31.1	0.7	ss	-4.3	135	29.1	-1.6	20	3.7	21.2
24	178	25.7	4.5	1	29.6	23.6		2.7	183	24.0	102.3	0.9	2	31.5	-31.8	0.3	ss	-4.3	135	27.5	-1.5	20	24.9	20.9
25	178	30.2	4.5	1	53.2	23.5		2.6	185	6.3	99.7	1.3	1	59.7	-31.8	0.0	ss	-4.3	135	26.0	-1.3	20	45.8	20.4
26	178	34.7	4.5	2	16.7	23.5	sr	2.5	186	46.0	96.3	1.7	1	27.9	-31.4	-0.2	ss	-4.4	135	24.7	-1.1	21	6.2	19.9
27	178	39.3	4.5	2	40.2	23.5	sr	2.4	188	22.3	92.4	2.0	0	56.5	-30.5	-0.5	ss	-4.4	135	23.5	-0.9	21	26.1	19.5
28	178	43.8	4.5	3	3.7	23.4	sr	2.2	189	54.7	88.0	2.2	0	26.0	-29.2	-0.6	ss	-4.4	135	22.6	-0.7	21	45.6	19.0
29	178	48.3	4.5	3	27.1	23.3	sr	2.1	191	22.7	83.3	2.4	-0	3.2	-27.5	-0.9	ss	-4.4	135	21.9	-0.5	22	4.6	18.5
30	178	52.8	4.5	3	50.4	23.3	sr	2.0	192	45.9	78.3	2.5	-0	30.7	-25.5	-1.0	ss	-4.4	135	21.4	-0.2	22	23.1	18.1
Mar 31	178	57.3	4.5	4	13.7	23.2	sr	1.9	194	4.3	73.2	2.5	-0	56.2	-23.3	-1.1	ss	-4.4	135	21.2	0.1	22	41.2	17.5
Apr 1	179	1.8	4.4	4	36.9	23.0	sr	1.8	195	17.5	68.1	2.6	-1	19.5	-21.0	-1.2	ss	-4.4	135	21.2	0.4	22	58.7	17.0
2	179	6.2	4.4	4	59.9	23.1	sr	1.7	196	25.5	62.9	2.6	-1	40.5	-18.4	-1.3	ss	-4.4	135	21.6	0.7	23	15.7	16.6
3	179	10.6	4.4	5	23.0	22.9	sr	1.6	197	28.5	57.9	2.5	-1	58.9	-16.0	-1.2	ss	-4.4	135	22.3	1.1	23	32.3	16.0
4	179	15.0	4.3	5	45.9	22.8	sr	1.5	198	26.3	52.9	2.5	-2	14.9	-13.3	-1.3	ss	-4.4	135	23.4	1.5	23	48.3	15.6
5	179	19.4	4.3	6	8.7	22.7	sr	1.4	199	19.3	48.2	2.4	-2	28.2	-10.7	-1.3	ss	-4.4	135	24.8	1.9	24	3.9	15.0
6	179	23.7	4.3	6	31.4	22.5	sr	1.3	200	7.4	43.5	2.3	-2	38.9	-8.2	-1.3	ss	-4.4	135	26.7	2.3	24	18.9	14.5
7	179	27.9	4.2	6	53.9	22.5	sr	1.1	200	51.0	39.1	2.2	-2	47.1	-5.6	-1.3	ss	-4.4	135	29.0	2.8	24	33.4	14.0
8	179	32.1	4.1	7	16.4	22.4	sr	1.0	201	30.1	34.9	2.1	-2	52.7	-3.2	-1.2	ss	-4.4	135	31.8	3.3	24	47.4	13.5
9	179	36.3	4.1	7	38.8	22.2	sr	1.0	202	5.0	30.9	2.0	-2	55.9	-0.7	-1.3	ss	-4.4	135	35.1	3.8	25	0.9	13.0
10	179	40.3	4.0	8	1.0	22.1	sr	0.9	202	36.0	27.1	1.9	-2	56.6	1.6	-1.2	ss	-4.4	135	39.0	4.4	25	13.9	12.4
11	179	44.3	3.9	8	23.1	21.9	sr	0.8	203	3.1	23.5	1.8	-2	55.0	3.9	-1.2	ss	-4.4	135	43.4	5.0	25	26.3	11.9
12	179	48.2	3.8	8	45.0	21.8	sr	0.7	203	26.6	20.1	1.7	-2	51.1	6.1	-1.1	ss	-4.5	135	48.4	5.7	25	38.2	11.4
13	179	52.1	3.8	9	6.8	21.7	sr	0.7	203	46.7	16.9	1.6	-2	45.0	8.3	-1.1	ss	-4.5	135	54.1	6.4	25	49.6	10.9
14	179	55.8	3.7	9	28.5	21.5	sr	0.6	204	3.6	13.8	1.5	-2	36.7	10.3	-1.0	ss	-4.5	136	0.5	7.1	26	0.5	10.3
15	179	59.5	3.6	9	50.0	21.3	sr	0.6	204	17.4	11.0	1.4	-2	26.4	12.3	-1.0	ss	-4.5	136	7.6	7.9	26	10.8	9.8
16	180	3.1	3.5	10	11.3	21.2	sr	0.5	204	28.4	8.2	1.4	-2	14.1	14.1	-0.9	ss	-4.5	136	15.4	8.7	26	20.6	9.3
17	180	6.5	3.4	10	32.5	21.0	sr	0.5	204	36.6	5.6	1.3	-2	0.0	16.0	-1.0	ss	-4.5	136	24.1	9.5	26	29.9	8.8
18	180	9.9	3.3	10	53.5	20.8	sr	0.4	204	42.2	3.2	1.2	-1	44.0	17.8	-0.9	ss	-4.5	136	33.6	10.4	26	38.7	8.2
19	180	13.2	3.2	11	14.3	20.6	sr	0.4	204	45.4	0.8	1.2	-1	26.2	19.5	-0.9	ss	-4.5	136	44.1	11.4	26	46.9	7.7
20	180	16.3	3.1	11	34.9	20.5	sr	0.4	204	46.2	-1.4	1.1	-1	6.7	21.1	-0.8	ss	-4.5	136	55.5	12.4	26	54.6	7.3
21	180	19.4	2.9	11	55.4	20.2	sr	0.3	204	44.8	-3.6	1.1	-0	45.6	22.6	-0.8	ss	-4.5	137	7.9	13.5	27	1.9	6.6
22	180	22.3	2.8	12	15.6	20.1	sr	0.3	204	41.2	-5.7	1.0	-0	23.0	24.2	-0.8	ss	-4.5	137	21.3	14.6	27	8.5	6.2
23	180	25.2	2.7	12	35.7	19.8	sr	0.3	204	35.5	-7.7	1.0	0	1.2	25.6	-0.7	ss	-4.5	137	35.9	15.8	27	14.7	5.7
24	180	27.9	2.6	12	55.5	19.6	sr	0.2	204	27.8	-9.6	1.0	0	26.8	27.0	-0.7	ss	-4.5	137	51.7	17.0	27	20.4	5.2
25	180	30.5	2.5	13	15.1	19.4	sr	0.2	204	18.2	-11.5	0.9	0	53.8	28.4	-0.7	ss	-4.5	138	8.7	18.3	27	25.6	4.6
26	180	33.0	2.4	13	34.5	19.2	sr	0.2	204	6.7	-13.4	0.9	1	22.2	29.7	-0.6	ss	-4.5	138	27.0	19.7	27	30.2	4.1
27	180	35.3	2.2	13	53.7	19.0	sr	0.1	203	53.4	-15.2	0.9	1	51.9	30.9	-0.6	ss	-4.5	138	46.7	21.1	27	34.3	3.7
28	180	37.6	2.1	14	12.7	18.7	sr	0.1	203	38.2	-17.0	0.9	2	22.8	32.1	-0.6	ss	-4.5	139	7.8	22.6	27	38.0	3.1
29	180	39.7	2.0	14	31.4	18.4	sr	0.0	203	21.2	-18.8	0.9	2	54.9	33.2	-0.5	ss	-4.5	139	30.4	24.2	27	41.1	2.7
Apr 30	180	41.7	1.9	14	49.8	18.3	sr	0.0	203	2.4	-20.6	0.9	3	28.1	34.3	-0.6	ss	-4.5	139	54.6	25.8	27	43.8	2.1
May 1	180	43.6	1.7	15	8.1	17.9	sr	0.0	202	41.8	-22.4	0.9	4	2.4	35.4	-0.5	ss	-4.5	140	20.4	27.5	27	45.9	1.6
2	180	45.3	1.6	15	26.0	17.8	sr	-0.1	202	19.4	-24.2	0.9	4	37.8	36.4	-0.5	ss	-4.5	140	47.9	29.3	27	47.5	1.2
3	180	46.9	1.5	15	43.8	17.4	sr	-0.1	201	55.2	-26.0	0.9	5	14.2	37.4	-0.5	ss	-4.5	141	17.2	31.2	27	48.7	0.6
4	180	48.4	1.3	16	1.2	17.2	sr	-0.2	201	29.2	-27.9	0.9	5	51.6	38.2	-0.4	ss	-4.5	141	48.4	33.1	27	49.3	0.1
5	180	49.7	1.2	16	18.4	16.9	sr	-0.2	201	1.3	-29.8	1.0	6	29.8	39.1	-0.4	ss	-4.5	142	21.5	35.1	27	49.4	-0.3
6	180	50.9	1.1	16	35.3	16.7	sr	-0.3	200	31.5	-31.7	1.0	7	8.9	39.9	-0.4	ss	-4.5	142	56.6	37.2	27	49.1	-0.9
7	180	52.0	0.9	16	52.0	16.3	sr	-0.3	199	59.8	-33.7	1.0	7	48.8	40.6	-0.3	ss	-4.5	143	33.8	39.3	27	48.2	-1.4
8	180	52.9	0.8	17	8.3	16.1	sr	-0.4	199	26.1	-35.7	1.0	8	29.4	41.4	-0.4	ss	-4.5	144	13.1	41.5	27	46.8	-1.9
May 9	180	53.6	0.6	17	24.4	15.8	sr	-0.5	198	50.4	-37.8	1.0	9	10.8	41.9	-0.3	ss	-4.5	144	54.6	43.8	27	44.9	-2.4

2012 Sun and Planets

Date	Mars vis	mag	GHA °	'	d '	Dec °	'	d '	Jupiter vis	mag	GHA °	'	d '	Dec °	'	d '	Saturn vis	mag	GHA °	'	d '	Dec °	'	d '
Mar 6	y	-1.2	358	22.3	81.7	10	34.9	8.2	y	-2.2	128	13.7	48.1	13	15.9	3.8	y	1.0	316	20.1	61.7	-8	33.1	1.2
7	y	-1.2	359	44.0	81.6	10	43.1	8.0	y	-2.2	129	1.8	48.0	13	19.7	3.9	y	1.0	317	21.8	61.7	-8	31.9	1.2
8	y	-1.2	1	5.6	81.5	10	51.1	7.9	y	-2.1	129	49.8	47.9	13	23.6	3.9	y	1.0	318	23.5	61.8	-8	30.7	1.2
9	y	-1.2	2	27.1	81.4	10	59.0	7.7	y	-2.1	130	37.8	47.9	13	27.5	3.9	y	1.0	319	25.3	61.9	-8	29.5	1.2
10	y	-1.2	3	48.5	81.2	11	6.7	7.5	y	-2.1	131	25.6	47.8	13	31.4	3.9	y	1.0	320	27.3	62.0	-8	28.3	1.3
11	y	-1.2	5	9.7	81.0	11	14.2	7.3	y	-2.1	132	13.4	47.7	13	35.3	3.9	y	1.0	321	29.2	62.1	-8	27.0	1.3
12	y	-1.2	6	30.6	80.7	11	21.5	7.1	y	-2.1	133	1.1	47.6	13	39.2	4.0	y	1.0	322	31.3	62.1	-8	25.7	1.3
13	y	-1.1	7	51.4	80.4	11	28.6	6.9	y	-2.1	133	48.7	47.5	13	43.2	3.9	y	1.0	323	33.4	62.2	-8	24.4	1.3
14	y	-1.1	9	11.8	80.1	11	35.5	6.6	y	-2.1	134	36.1	47.4	13	47.1	4.0	y	1.0	324	35.6	62.3	-8	23.1	1.4
15	y	-1.1	10	31.9	79.7	11	42.1	6.3	y	-2.1	135	23.6	47.3	13	51.1	4.0	y	0.9	325	37.9	62.3	-8	21.7	1.4
16	y	-1.1	11	51.7	79.3	11	48.4	6.1	y	-2.1	136	10.9	47.2	13	55.1	4.0	y	0.9	326	40.2	62.4	-8	20.3	1.4
17	y	-1.1	13	11.0	78.9	11	54.5	5.9	y	-2.1	136	58.1	47.2	13	59.1	4.0	y	0.9	327	42.6	62.5	-8	18.9	1.4
18	y	-1.0	14	29.9	78.4	12	0.4	5.5	y	-2.1	137	45.3	47.1	14	3.1	4.0	y	0.9	328	45.1	62.5	-8	17.5	1.4
19	y	-1.0	15	48.3	77.9	12	5.9	5.3	y	-2.1	138	32.3	47.0	14	7.1	4.1	y	0.9	329	47.6	62.6	-8	16.1	1.5
20	y	-1.0	17	6.3	77.4	12	11.2	4.9	y	-2.1	139	19.3	46.9	14	11.2	4.0	y	0.9	330	50.2	62.7	-8	14.6	1.5
21	y	-1.0	18	23.7	76.8	12	16.1	4.7	y	-2.1	140	6.3	46.8	14	15.2	4.1	y	0.9	331	52.9	62.7	-8	13.1	1.5
22	y	-1.0	19	40.5	76.3	12	20.8	4.4	y	-2.1	140	53.1	46.8	14	19.3	4.0	y	0.9	332	55.6	62.8	-8	11.6	1.5
23	y	-0.9	20	56.8	75.6	12	25.2	4.0	y	-2.1	141	39.9	46.7	14	23.3	4.1	y	0.9	333	58.4	62.8	-8	10.1	1.5
24	y	-0.9	22	12.4	75.0	12	29.2	3.8	y	-2.1	142	26.6	46.6	14	27.4	4.0	y	0.9	335	1.2	62.9	-8	8.6	1.6
25	y	-0.9	23	27.4	74.4	12	33.0	3.4	y	-2.1	143	13.2	46.6	14	31.4	4.1	y	0.9	336	4.1	62.9	-8	7.0	1.5
26	y	-0.9	24	41.8	73.7	12	36.4	3.1	y	-2.1	143	59.7	46.5	14	35.5	4.1	y	0.9	337	7.0	63.0	-8	5.5	1.6
27	y	-0.8	25	55.5	73.0	12	39.5	2.8	y	-2.1	144	46.2	46.4	14	39.6	4.1	y	0.9	338	10.0	63.0	-8	3.9	1.6
28	y	-0.8	27	8.5	72.3	12	42.3	2.5	y	-2.1	145	32.6	46.4	14	43.7	4.1	y	0.9	339	13.0	63.1	-8	2.3	1.6
29	y	-0.8	28	20.8	71.6	12	44.8	2.1	y	-2.1	146	19.0	46.3	14	47.8	4.1	y	0.9	340	16.1	63.1	-8	0.7	1.6
30	y	-0.8	29	32.3	70.8	12	46.9	1.9	y	-2.1	147	5.3	46.2	14	51.9	4.1	y	0.9	341	19.2	63.1	-7	59.1	1.6
Mar 31	y	-0.8	30	43.2	70.1	12	48.8	1.5	y	-2.1	147	51.5	46.2	14	56.0	4.0	y	0.9	342	22.3	63.2	-7	57.5	1.6
Apr 1	y	-0.7	31	53.3	69.4	12	50.3	1.2	y	-2.1	148	37.7	46.1	15	0.0	4.1	y	0.8	343	25.5	63.2	-7	55.9	1.6
2	y	-0.7	33	2.7	68.6	12	51.5	1.0	y	-2.1	149	23.8	46.0	15	4.1	4.1	y	0.8	344	28.7	63.2	-7	54.3	1.7
3	y	-0.7	34	11.3	67.9	12	52.5	0.6	y	-2.1	150	9.8	46.0	15	8.2	4.1	y	0.8	345	32.0	63.3	-7	52.6	1.6
4	y	-0.7	35	19.2	67.1	12	53.1	0.3	y	-2.1	150	55.8	45.9	15	12.3	4.1	y	0.8	346	35.2	63.3	-7	51.0	1.7
5	y	-0.6	36	26.4	66.4	12	53.4	0.0	y	-2.1	151	41.7	45.9	15	16.4	4.1	y	0.8	347	38.6	63.3	-7	49.3	1.6
6	y	-0.6	37	32.8	65.7	12	53.4	-0.2	y	-2.1	152	27.6	45.8	15	20.5	4.1	y	0.8	348	41.9	63.4	-7	47.7	1.7
7	y	-0.6	38	38.4	64.9	12	53.2	-0.6	y	-2.0	153	13.4	45.8	15	24.6	4.1	y	0.8	349	45.2	63.4	-7	46.0	1.7
8	y	-0.6	39	43.3	64.2	12	52.6	-0.8	y	-2.0	153	59.2	45.7	15	28.7	4.1	y	0.8	350	48.6	63.4	-7	44.3	1.6
9	y	-0.5	40	47.5	63.4	12	51.8	-1.1	y	-2.0	154	44.9	45.7	15	32.8	4.0	y	0.8	351	52.0	63.4	-7	42.7	1.7
10	y	-0.5	41	51.0	62.7	12	50.7	-1.4	y	-2.0	155	30.6	45.6	15	36.8	4.1	y	0.8	352	55.4	63.4	-7	41.0	1.7
11	y	-0.5	42	53.7	62.0	12	49.3	-1.7	y	-2.0	156	16.2	45.6	15	40.9	4.1	y	0.8	353	58.9	63.4	-7	39.3	1.6
12	y	-0.5	43	55.7	61.3	12	47.6	-1.9	y	-2.0	157	1.8	45.5	15	45.0	4.0	y	0.8	355	2.3	63.5	-7	37.7	1.7
13	y	-0.4	44	56.9	60.6	12	45.7	-2.2	y	-2.0	157	47.3	45.5	15	49.0	4.1	y	0.8	356	5.8	63.5	-7	36.0	1.7
14	y	-0.4	45	57.5	59.9	12	43.5	-2.5	y	-2.0	158	32.8	45.4	15	53.1	4.0	y	0.8	357	9.2	63.5	-7	34.3	1.6
15	y	-0.4	46	57.3	59.2	12	41.0	-2.7	y	-2.0	159	18.3	45.4	15	57.1	4.1	y	0.8	358	12.7	63.5	-7	32.7	1.7
16	y	-0.4	47	56.5	58.5	12	38.3	-2.9	y	-2.0	160	3.7	45.4	16	1.2	4.0	y	0.8	359	16.2	63.5	-7	31.0	1.7
17	y	-0.3	48	55.0	57.8	12	35.4	-3.2	y	-2.0	160	49.0	45.3	16	5.2	4.0	y	0.8	0	19.6	63.5	-7	29.3	1.6
18	y	-0.3	49	52.7	57.1	12	32.2	-3.5	y	-2.0	161	34.3	45.3	16	9.2	4.0	y	0.8	1	23.1	63.5	-7	27.7	1.7
19	y	-0.3	50	49.8	56.4	12	28.7	-3.7	y	-2.0	162	19.6	45.2	16	13.2	4.0	y	0.8	2	26.6	63.5	-7	26.0	1.6
20	y	-0.3	51	46.2	55.8	12	25.0	-3.9	y	-2.0	163	4.8	45.2	16	17.2	4.0	y	0.8	3	30.1	63.5	-7	24.4	1.6
21	y	-0.3	52	42.0	55.1	12	21.1	-4.1	y	-2.0	163	50.0	45.2	16	21.2	4.0	y	0.8	4	33.5	63.4	-7	22.8	1.6
22	y	-0.2	53	37.1	54.5	12	17.0	-4.4	y	-2.0	164	35.2	45.1	16	25.2	4.0	y	0.8	5	37.0	63.4	-7	21.2	1.7
23	y	-0.2	54	31.6	53.8	12	12.6	-4.6	y	-2.0	165	20.3	45.1	16	29.2	3.9	y	0.8	6	40.4	63.4	-7	19.5	1.6
24	y	-0.2	55	25.4	53.2	12	8.0	-4.9	y	-2.0	166	5.4	45.1	16	33.1	4.0	y	0.8	7	43.8	63.4	-7	17.9	1.5
25	y	-0.2	56	18.6	52.6	12	3.1	-5.0	y	-2.0	166	50.5	45.0	16	37.1	3.9	y	0.8	8	47.2	63.4	-7	16.4	1.6
26	y	-0.1	57	11.2	52.0	11	58.1	-5.3	y	-2.0	167	35.5	45.0	16	41.0	3.9	y	0.8	9	50.6	63.4	-7	14.8	1.6
27	y	-0.1	58	3.2	51.4	11	52.8	-5.4	y	-2.0	168	20.5	45.0	16	44.9	4.0	y	0.8	10	54.0	63.3	-7	13.2	1.5
28	y	-0.1	58	54.6	50.8	11	47.4	-5.7	y	-2.0	169	5.5	45.0	16	48.9	3.8	y	0.8	11	57.3	63.3	-7	11.7	1.6
29	y	-0.1	59	45.5	50.3	11	41.7	-5.9	y	-2.0	169	50.4	44.9	16	52.7	3.9	y	0.8	13	0.6	63.3	-7	10.1	1.5
Apr 30	y	-0.1	60	35.7	49.7	11	35.8	-6.0	y	-2.0	170	35.4	44.9	16	56.6	3.9	y	0.8	14	3.9	63.2	-7	8.6	1.5
May 1	y	0.0	61	25.5	49.2	11	29.8	-6.3	y	-2.0	171	20.3	44.9	17	0.5	3.8	y	0.8	15	7.1	63.2	-7	7.1	1.5
2	y	0.0	62	14.7	48.7	11	23.5	-6.4	y	-2.0	172	5.2	44.9	17	4.3	3.9	y	0.9	16	10.3	63.2	-7	5.6	1.4
3	y	0.0	63	3.3	48.2	11	17.1	-6.6	y	-2.0	172	50.0	44.8	17	8.2	3.8	y	0.9	17	13.5	63.1	-7	4.2	1.5
4	y	0.0	63	51.5	47.7	11	10.5	-6.8		-2.0	173	34.9	44.8	17	12.0	3.8	y	0.9	18	16.7	63.1	-7	2.7	1.4
5	y	0.1	64	39.1	47.2	11	3.7	-7.0		-2.0	174	19.7	44.8	17	15.8	3.8	y	0.9	19	19.8	63.1	-7	1.3	1.4
6	y	0.1	65	26.3	46.7	10	56.7	-7.1		-2.0	175	4.5	44.8	17	19.6	3.7	y	0.9	20	22.8	63.0	-6	59.9	1.4
7	y	0.1	66	13.0	46.2	10	49.6	-7.4		-2.0	175	49.3	44.8	17	23.3	3.8	y	0.9	21	25.9	63.0	-6	58.5	1.3
8	y	0.1	66	59.2	45.8	10	42.2	-7.4		-2.0	176	34.0	44.8	17	27.1	3.7	y	0.9	22	28.8	62.9	-6	57.2	1.4
May 9	y	0.1	67	45.0	45.3	10	34.8	-7.7		-2.0	177	18.8	44.7	17	30.8	3.7	y	0.9	23	31.8	62.9	-6	55.8	1.3

2012 Sun and Planets

Date	SUN GHA °	'	d '	Dec °	'	d '
May 10	180	54.3	0.5	17	40.2	15.5
11	180	54.7	0.3	17	55.7	15.2
12	180	55.0	0.2	18	10.9	14.9
13	180	55.2	0.0	18	25.8	14.5
14	180	55.3	-0.1	18	40.3	14.3
15	180	55.1	-0.3	18	54.6	14.0
16	180	54.9	-0.4	19	8.6	13.6
17	180	54.5	-0.5	19	22.2	13.3
18	180	53.9	-0.7	19	35.5	12.9
19	180	53.2	-0.8	19	48.4	12.6
20	180	52.4	-1.0	20	1.0	12.3
21	180	51.4	-1.1	20	13.3	11.9
22	180	50.3	-1.2	20	25.2	11.6
23	180	49.1	-1.4	20	36.8	11.3
24	180	47.8	-1.5	20	48.1	10.8
25	180	46.3	-1.6	20	58.9	10.5
26	180	44.7	-1.7	21	9.4	10.2
27	180	43.0	-1.8	21	19.6	9.7
28	180	41.1	-1.9	21	29.3	9.4
29	180	39.2	-2.0	21	38.7	9.1
30	180	37.2	-2.1	21	47.8	8.6
May 31	180	35.0	-2.2	21	56.4	8.3
Jun 1	180	32.8	-2.3	22	4.7	7.8
2	180	30.5	-2.4	22	12.5	7.5
3	180	28.1	-2.5	22	20.0	7.1
4	180	25.5	-2.6	22	27.1	6.7
5	180	22.9	-2.7	22	33.8	6.3
6	180	20.3	-2.8	22	40.1	6.0
7	180	17.5	-2.8	22	46.1	5.5
8	180	14.7	-2.9	22	51.6	5.1
9	180	11.8	-3.0	22	56.7	4.7
10	180	8.8	-3.0	23	1.4	4.3
11	180	5.8	-3.1	23	5.7	3.9
12	180	2.7	-3.1	23	9.6	3.5
13	179	59.6	-3.2	23	13.1	3.1
14	179	56.4	-3.2	23	16.2	2.6
15	179	53.2	-3.2	23	18.8	2.3
16	179	50.0	-3.3	23	21.1	1.8
17	179	46.7	-3.3	23	22.9	1.5
18	179	43.5	-3.3	23	24.4	1.0
19	179	40.2	-3.3	23	25.4	0.6
20	179	36.9	-3.3	23	26.0	0.2
21	179	33.6	-3.3	23	26.2	-0.3
22	179	30.3	-3.3	23	25.9	-0.6
23	179	27.0	-3.2	23	25.3	-1.0
24	179	23.8	-3.2	23	24.3	-1.5
25	179	20.6	-3.2	23	22.8	-1.9
26	179	17.4	-3.1	23	20.9	-2.2
27	179	14.3	-3.1	23	18.7	-2.7
28	179	11.2	-3.0	23	16.0	-3.1
29	179	8.2	-3.0	23	12.9	-3.5
Jun 30	179	5.2	-2.9	23	9.4	-3.9
Jul 1	179	2.3	-2.8	23	5.5	-4.4
2	178	59.5	-2.8	23	1.1	-4.7
3	178	56.7	-2.7	22	56.4	-5.1
4	178	54.0	-2.6	22	51.3	-5.5
5	178	51.4	-2.5	22	45.8	-5.9
6	178	48.9	-2.4	22	39.9	-6.3
7	178	46.5	-2.3	22	33.6	-6.7
8	178	44.1	-2.2	22	26.9	-7.1
9	178	41.9	-2.1	22	19.8	-7.4
10	178	39.7	-2.0	22	12.4	-7.9
11	178	37.7	-1.9	22	4.5	-8.2
12	178	35.8	-1.8	21	56.3	-8.6
Jul 13	178	33.9	-1.7	21	47.7	-9.0

Date	Mercury vis	mag	GHA °	'	d '	dd '	Dec °	'	d '	dd '
May 10	sr	-0.5	198	12.5	-40.0	1.1	9	52.7	42.5	-0.3
11	sr	-0.6	197	32.5	-42.2	1.1	10	35.2	42.9	-0.2
12	sr	-0.7	196	50.3	-44.5	1.1	11	18.1	43.4	-0.3
13	sr	-0.7	196	5.8	-46.9	1.2	12	1.5	43.6	-0.1
14	sr	-0.8	195	18.9	-49.3	1.2	12	45.1	43.8	-0.1
15	sr	-0.9	194	29.6	-51.8	1.2	13	28.9	43.9	-0.1
16	sr	-1.0	193	37.9	-54.3	1.3	14	12.8	43.9	0.0
17	sr	-1.1	192	43.6	-56.8	1.3	14	56.7	43.7	0.1
18	sr	-1.2	191	46.8	-59.4	1.3	15	40.4	43.4	0.1
19	sr	-1.3	190	47.4	-62.0	1.3	16	23.8	43.0	0.2
20	sr	-1.4	189	45.4	-64.6	1.3	17	6.8	42.3	0.4
21	sr	-1.5	188	40.8	-67.1	1.3	17	49.1	41.5	0.4
22		-1.6	187	33.7	-69.5	1.2	18	30.6	40.4	0.5
23		-1.7	186	24.2	-71.8	1.2	19	11.0	39.3	0.6
24		-1.9	185	12.4	-74.0	1.1	19	50.3	37.9	0.7
25		-2.0	183	58.5	-75.9	1.0	20	28.2	36.2	0.9
26		-2.1	182	42.5	-77.6	0.9	21	4.4	34.4	0.9
27		-2.3	181	24.9	-79.1	0.7	21	38.8	32.4	1.0
28		-2.3	180	5.8	-80.2	0.6	22	11.2	30.3	1.0
29		-2.1	178	45.5	-81.0	0.4	22	41.5	27.8	1.3
30		-2.0	177	24.5	-81.5	0.2	23	9.3	25.4	1.2
May 31		-1.9	176	3.0	-81.6	0.0	23	34.7	22.8	1.3
Jun 1		-1.8	174	41.4	-81.3	-0.1	23	57.5	20.1	1.3
2		-1.6	173	20.2	-80.6	-0.3	24	17.6	17.4	1.3
3	ss	-1.5	171	59.5	-79.7	-0.5	24	35.0	14.6	1.4
4	ss	-1.4	170	39.9	-78.3	-0.7	24	49.6	11.8	1.4
5	ss	-1.3	169	21.5	-76.7	-0.8	25	1.4	9.1	1.4
6	ss	-1.2	168	4.8	-74.8	-0.9	25	10.5	6.4	1.3
7	ss	-1.1	166	50.0	-72.7	-1.1	25	16.9	3.9	1.3
8	ss	-1.0	165	37.3	-70.3	-1.2	25	20.8	1.3	1.3
9	ss	-0.9	164	27.0	-67.8	-1.3	25	22.1	-1.2	1.3
10	ss	-0.8	163	19.3	-65.1	-1.3	25	20.9	-3.4	1.1
11	ss	-0.8	162	14.2	-62.2	-1.4	25	17.5	-5.7	1.2
12	ss	-0.7	161	11.9	-59.3	-1.5	25	11.8	-7.7	1.0
13	ss	-0.6	160	12.6	-56.3	-1.5	25	4.1	-9.7	1.0
14	ss	-0.5	159	16.4	-53.2	-1.6	24	54.4	-11.5	0.9
15	ss	-0.4	158	23.2	-50.0	-1.6	24	42.9	-13.2	0.8
16	ss	-0.4	157	33.2	-46.8	-1.6	24	29.7	-14.8	0.8
17	ss	-0.3	156	46.4	-43.6	-1.6	24	14.9	-16.3	0.8
18	ss	-0.2	156	2.8	-40.3	-1.6	23	58.6	-17.6	0.6
19	ss	-0.2	155	22.6	-37.0	-1.7	23	41.0	-18.8	0.6
20	ss	-0.1	154	45.6	-33.6	-1.7	23	22.2	-20.0	0.6
21	ss	0.0	154	11.9	-30.3	-1.7	23	2.2	-20.9	0.5
22	ss	0.0	153	41.6	-26.9	-1.7	22	41.3	-21.9	0.5
23	ss	0.1	153	14.7	-23.5	-1.7	22	19.4	-22.6	0.4
24	ss	0.1	152	51.2	-20.1	-1.7	21	56.8	-23.2	0.3
25	ss	0.2	152	31.1	-16.6	-1.7	21	33.6	-23.9	0.3
26	ss	0.3	152	14.5	-13.2	-1.7	21	9.7	-24.3	0.2
27	ss	0.3	152	1.3	-9.6	-1.8	20	45.4	-24.7	0.2
28	ss	0.4	151	51.7	-6.1	-1.8	20	20.7	-24.9	0.1
29	ss	0.4	151	45.6	-2.5	-1.8	19	55.8	-25.1	0.1
Jun 30	ss	0.5	151	43.1	1.2	-1.8	19	30.7	-25.1	0.0
Jul 1	ss	0.6	151	44.4	4.9	-1.9	19	5.6	-25.1	0.0
2	ss	0.6	151	49.3	8.7	-1.9	18	40.5	-25.0	0.0
3	ss	0.7	151	58.0	12.6	-1.9	18	15.5	-24.6	-0.2
4	ss	0.7	152	10.6	16.5	-2.0	17	50.9	-24.4	-0.1
5	ss	0.8	152	27.2	20.6	-2.0	17	26.5	-23.8	-0.3
6	ss	0.9	152	47.7	24.7	-2.1	17	2.7	-23.3	-0.3
7	ss	1.0	153	12.4	28.9	-2.1	16	39.4	-22.6	-0.4
8	ss	1.0	153	41.2	33.1	-2.1	16	16.8	-21.8	-0.4
9	ss	1.1	154	14.4	37.5	-2.2	15	55.0	-21.0	-0.4
10	ss	1.2	154	51.9	42.0	-2.2	15	34.0	-19.8	-0.6
11	ss	1.3	155	33.9	46.5	-2.3	15	14.2	-18.8	-0.5
12	ss	1.4	156	20.4	51.1	-2.3	14	55.4	-17.4	-0.7
Jul 13	ss	1.6	157	11.5	55.8	-2.3	14	38.0	-16.2	-0.6

Date	Venus vis	mag	GHA °	'	d '	Dec °	'	d '
May 10	ss	-4.5	145	38.3	46.1	27	42.5	-3.0
11	ss	-4.5	146	24.4	48.5	27	39.5	-3.4
12	ss	-4.5	147	12.9	50.9	27	36.1	-4.1
13	ss	-4.5	148	3.8	53.4	27	32.0	-4.6
14	ss	-4.4	148	57.3	56.0	27	27.4	-5.1
15	ss	-4.4	149	53.2	58.6	27	22.3	-5.7
16	ss	-4.4	150	51.8	61.2	27	16.6	-6.4
17	ss	-4.4	151	53.0	63.8	27	10.2	-6.9
18	ss	-4.4	152	56.8	66.5	27	3.3	-7.6
19	ss	-4.4	154	3.3	69.1	26	55.7	-8.2
20	ss	-4.3	155	12.4	71.8	26	47.5	-8.8
21	ss	-4.3	156	24.2	74.4	26	38.7	-9.5
22	ss	-4.3	157	38.6	77.0	26	29.2	-10.2
23	ss	-4.3	158	55.5	79.5	26	19.0	-10.8
24	ss	-4.2	160	15.0	81.9	26	8.2	-11.6
25	ss	-4.2	161	37.0	84.3	25	56.6	-12.2
26	ss	-4.2	163	1.3	86.5	25	44.4	-12.9
27	ss	-4.1	164	27.8	88.6	25	31.5	-13.5
28	ss	-4.1	165	56.4	90.6	25	18.0	-14.3
29	ss	-4.1	167	27.0	92.3	25	3.7	-14.8
30	ss	-4.0	168	59.3	93.9	24	48.9	-15.5
May 31	ss	-4.0	170	33.2	95.3	24	33.4	-16.0
Jun 1	ss	-3.9	172	8.5	96.4	24	17.4	-16.6
2		-3.9	173	44.9	97.2	24	0.8	-17.0
3		-3.8	175	22.1	97.9	23	43.8	-17.4
4		-3.8	176	60.0	98.2	23	26.4	-17.8
5		-3.7	178	38.2	98.3	23	8.6	-18.0
6		-3.7	180	16.5	98.1	22	50.6	-18.2
7		-3.8	181	54.6	97.7	22	32.4	-18.3
8		-3.8	183	32.3	97.0	22	14.1	-18.3
9		-3.8	185	9.3	96.1	21	55.8	-18.2
10		-3.9	186	45.4	94.9	21	37.6	-18.0
11	sr	-3.9	188	20.4	93.6	21	19.6	-17.7
12	sr	-4.0	189	53.9	92.0	21	1.9	-17.4
13	sr	-4.0	191	25.9	90.3	20	44.5	-17.0
14	sr	-4.1	192	56.2	88.4	20	27.5	-16.5
15	sr	-4.1	194	24.7	86.4	20	11.0	-15.8
16	sr	-4.1	195	51.1	84.3	19	55.2	-15.3
17	sr	-4.2	197	15.4	82.1	19	39.9	-14.5
18	sr	-4.2	198	37.5	79.8	19	25.4	-13.8
19	sr	-4.2	199	57.3	77.5	19	11.6	-13.0
20	sr	-4.3	201	14.8	75.1	18	58.6	-12.2
21	sr	-4.3	202	29.9	72.7	18	46.4	-11.3
22	sr	-4.3	203	42.6	70.3	18	35.1	-10.5
23	sr	-4.3	204	52.9	67.9	18	24.6	-9.6
24	sr	-4.3	206	0.8	65.5	18	15.0	-8.8
25	sr	-4.4	207	6.2	63.1	18	6.2	-7.9
26	sr	-4.4	208	9.3	60.7	17	58.3	-7.1
27	sr	-4.4	209	10.1	58.4	17	51.2	-6.2
28	sr	-4.4	210	8.5	56.1	17	45.0	-5.4
29	sr	-4.4	211	4.6	53.9	17	39.6	-4.5
Jun 30	sr	-4.4	211	58.4	51.7	17	35.1	-3.8
Jul 1	sr	-4.4	212	50.1	49.5	17	31.3	-3.1
2	sr	-4.5	213	39.6	47.4	17	28.2	-2.3
3	sr	-4.5	214	27.0	45.3	17	25.9	-1.6
4	sr	-4.5	215	12.3	43.3	17	24.3	-0.9
5	sr	-4.5	215	55.6	41.4	17	23.4	-0.3
6	sr	-4.5	216	37.0	39.5	17	23.1	0.3
7	sr	-4.5	217	16.5	37.7	17	23.4	0.8
8	sr	-4.5	217	54.2	35.9	17	24.2	1.4
9	sr	-4.5	218	30.1	34.2	17	25.6	1.9
10	sr	-4.5	219	4.2	32.5	17	27.5	2.3
11	sr	-4.5	219	36.7	30.9	17	29.8	2.8
12	sr	-4.5	220	7.6	29.3	17	32.6	3.2
Jul 13	sr	-4.5	220	36.9	27.8	17	35.8	3.5

2012 Sun and Planets

Date	Mars vis	mag	GHA °	'	d '	Dec °	'	d '	Jupiter vis	mag	GHA °	'	d '	Dec °	'	d '	Saturn vis	mag	GHA °	'	d '	Dec °	'	d '
May 10	y	0.2	68	30.3	44.9	10	27.1	-7.8		-2.0	178	3.5	44.7	17	34.5	3.7	y	0.9	24	34.7	62.8	-6	54.5	1.3
11	y	0.2	69	15.1	44.4	10	19.3	-8.0		-2.0	178	48.3	44.7	17	38.2	3.7	y	0.9	25	37.5	62.8	-6	53.2	1.3
12	y	0.2	69	59.6	44.0	10	11.3	-8.1		-2.0	179	33.0	44.7	17	41.9	3.6	y	0.9	26	40.3	62.7	-6	51.9	1.2
13	y	0.2	70	43.6	43.6	10	3.2	-8.3		-2.0	180	17.7	44.7	17	45.5	3.6	y	0.9	27	43.0	62.7	-6	50.7	1.2
14	y	0.2	71	27.2	43.2	9	54.9	-8.4		-2.0	181	2.4	44.7	17	49.1	3.6	y	0.9	28	45.7	62.6	-6	49.5	1.2
15	y	0.2	72	10.4	42.8	9	46.5	-8.6		-2.0	181	47.1	44.7	17	52.7	3.6	y	0.9	29	48.3	62.6	-6	48.3	1.2
16	y	0.3	72	53.2	42.4	9	37.9	-8.8		-2.0	182	31.8	44.7	17	56.3	3.6	y	0.9	30	50.9	62.5	-6	47.1	1.1
17	y	0.3	73	35.7	42.0	9	29.1	-8.8		-2.0	183	16.4	44.7	17	59.9	3.6	y	0.9	31	53.4	62.4	-6	46.0	1.1
18	y	0.3	74	17.7	41.7	9	20.3	-9.1		-2.0	184	1.1	44.7	18	3.5	3.5	y	1.0	32	55.8	62.4	-6	44.9	1.1
19	y	0.3	74	59.4	41.3	9	11.2	-9.2		-2.0	184	45.8	44.7	18	7.0	3.5	y	1.0	33	58.2	62.3	-6	43.8	1.1
20	y	0.3	75	40.7	40.9	9	2.0	-9.3		-2.0	185	30.4	44.7	18	10.5	3.5	y	1.0	35	0.5	62.2	-6	42.7	1.0
21	y	0.3	76	21.6	40.6	8	52.7	-9.4		-2.0	186	15.1	44.7	18	14.0	3.4	y	1.0	36	2.8	62.2	-6	41.7	1.0
22	y	0.4	77	2.2	40.2	8	43.3	-9.6		-2.0	186	59.7	44.7	18	17.4	3.5	y	1.0	37	5.0	62.1	-6	40.7	0.9
23	y	0.4	77	42.4	39.9	8	33.7	-9.8		-2.0	187	44.4	44.7	18	20.9	3.4	y	1.0	38	7.1	62.0	-6	39.8	1.0
24	y	0.4	78	22.3	39.6	8	23.9	-9.8	y	-2.0	188	29.1	44.7	18	24.3	3.3	y	1.0	39	9.1	62.0	-6	38.8	0.9
25	y	0.4	79	1.9	39.3	8	14.1	-10.0	y	-2.0	189	13.7	44.7	18	27.6	3.4	y	1.0	40	11.1	61.9	-6	37.9	0.8
26	y	0.4	79	41.2	39.0	8	4.1	-10.1	y	-2.0	189	58.4	44.7	18	31.0	3.4	y	1.0	41	13.0	61.8	-6	37.1	0.9
27	y	0.4	80	20.2	38.6	7	54.0	-10.3	y	-2.0	190	43.1	44.7	18	34.4	3.3	y	1.0	42	14.8	61.7	-6	36.2	0.8
28	y	0.5	80	58.8	38.4	7	43.7	-10.3	y	-2.0	191	27.8	44.7	18	37.7	3.3	y	1.0	43	16.5	61.7	-6	35.4	0.7
29	y	0.5	81	37.2	38.1	7	33.4	-10.5	y	-2.0	192	12.5	44.7	18	41.0	3.2	y	1.0	44	18.2	61.6	-6	34.7	0.8
30	y	0.5	82	15.2	37.8	7	22.9	-10.6	y	-2.0	192	57.2	44.7	18	44.2	3.3	y	1.0	45	19.8	61.5	-6	33.9	0.7
May 31	y	0.5	82	53.0	37.5	7	12.3	-10.7	y	-2.0	193	42.0	44.7	18	47.5	3.2	y	1.0	46	21.3	61.4	-6	33.2	0.6
Jun 1	y	0.5	83	30.5	37.2	7	1.6	-10.8	y	-2.0	194	26.7	44.8	18	50.7	3.2	y	1.0	47	22.7	61.3	-6	32.6	0.7
2	y	0.5	84	7.7	37.0	6	50.8	-11.0	y	-2.0	195	11.5	44.8	18	53.9	3.1	y	1.0	48	24.1	61.3	-6	31.9	0.6
3	y	0.5	84	44.7	36.7	6	39.8	-11.0	y	-2.0	195	56.2	44.8	18	57.0	3.1	y	1.1	49	25.3	61.2	-6	31.3	0.5
4	y	0.6	85	21.4	36.5	6	28.8	-11.2	y	-2.0	196	41.0	44.8	19	0.1	3.2	y	1.1	50	26.5	61.1	-6	30.8	0.5
5	y	0.6	85	57.9	36.2	6	17.6	-11.3	y	-2.0	197	25.8	44.8	19	3.3	3.0	y	1.1	51	27.6	61.0	-6	30.3	0.5
6	y	0.6	86	34.1	36.0	6	6.3	-11.3	y	-2.0	198	10.6	44.8	19	6.3	3.1	y	1.1	52	28.6	60.9	-6	29.8	0.5
7	y	0.6	87	10.1	35.7	5	55.0	-11.5	y	-2.0	198	55.5	44.9	19	9.4	3.0	y	1.1	53	29.6	60.8	-6	29.3	0.4
8	y	0.6	87	45.8	35.5	5	43.5	-11.6	y	-2.0	199	40.4	44.9	19	12.4	3.0	y	1.1	54	30.4	60.8	-6	28.9	0.4
9	y	0.6	88	21.3	35.3	5	31.9	-11.6	y	-2.0	200	25.2	44.9	19	15.4	3.0	y	1.1	55	31.2	60.7	-6	28.5	0.3
10	y	0.6	88	56.6	35.0	5	20.3	-11.8	y	-2.0	201	10.2	44.9	19	18.4	2.9	y	1.1	56	31.8	60.6	-6	28.2	0.3
11	y	0.7	89	31.6	34.8	5	8.5	-11.9	y	-2.0	201	55.1	45.0	19	21.3	3.0	y	1.1	57	32.4	60.5	-6	27.9	0.3
12	y	0.7	90	6.4	34.6	4	56.6	-12.0	y	-2.0	202	40.1	45.0	19	24.3	2.9	y	1.1	58	32.9	60.4	-6	27.6	0.3
13	y	0.7	90	41.0	34.4	4	44.6	-12.0	y	-2.0	203	25.0	45.0	19	27.2	2.8	y	1.1	59	33.3	60.3	-6	27.3	0.2
14	y	0.7	91	15.4	34.2	4	32.6	-12.2	y	-2.0	204	10.1	45.1	19	30.0	2.9	y	1.1	60	33.7	60.2	-6	27.1	0.1
15	y	0.7	91	49.6	34.0	4	20.4	-12.2	y	-2.0	204	55.1	45.1	19	32.9	2.8	y	1.1	61	33.9	60.1	-6	27.0	0.1
16	y	0.7	92	23.5	33.7	4	8.2	-12.4	y	-2.0	205	40.2	45.1	19	35.7	2.7	y	1.1	62	34.1	60.1	-6	26.9	0.1
17	y	0.7	92	57.3	33.5	3	55.8	-12.4	y	-2.0	206	25.3	45.1	19	38.4	2.8	y	1.1	63	34.1	60.0	-6	26.8	0.1
18	y	0.7	93	30.8	33.3	3	43.4	-12.5	y	-2.0	207	10.5	45.2	19	41.2	2.7	y	1.1	64	34.1	59.9	-6	26.7	0.0
19	y	0.7	94	4.2	33.1	3	30.9	-12.6	y	-2.0	207	55.6	45.2	19	43.9	2.7	y	1.1	65	33.9	59.8	-6	26.7	0.0
20	y	0.8	94	37.3	32.9	3	18.3	-12.7	y	-2.0	208	40.9	45.3	19	46.6	2.7	y	1.1	66	33.7	59.7	-6	26.7	-0.1
21	y	0.8	95	10.2	32.8	3	5.6	-12.7	y	-2.0	209	26.1	45.3	19	49.3	2.6	y	1.2	67	33.4	59.6	-6	26.8	-0.1
22	y	0.8	95	43.0	32.6	2	52.9	-12.9	y	-2.0	210	11.4	45.3	19	51.9	2.6	y	1.2	68	33.0	59.5	-6	26.9	-0.1
23	y	0.8	96	15.6	32.4	2	40.0	-12.9	y	-2.0	210	56.8	45.4	19	54.5	2.6	y	1.2	69	32.5	59.4	-6	27.0	-0.2
24	y	0.8	96	47.9	32.2	2	27.1	-13.0	y	-2.0	211	42.2	45.4	19	57.1	2.5	y	1.2	70	31.9	59.3	-6	27.2	-0.2
25	y	0.8	97	20.1	32.0	2	14.1	-13.1	y	-2.0	212	27.6	45.5	19	59.6	2.6	y	1.2	71	31.2	59.2	-6	27.4	-0.3
26	y	0.8	97	52.1	31.8	2	1.0	-13.1	y	-2.0	213	13.1	45.5	20	2.2	2.5	y	1.2	72	30.4	59.1	-6	27.7	-0.3
27	y	0.8	98	24.0	31.7	1	47.9	-13.2	y	-2.0	213	58.6	45.6	20	4.7	2.4	y	1.2	73	29.5	59.0	-6	28.0	-0.3
28	y	0.8	98	55.6	31.5	1	34.7	-13.3	y	-2.0	214	44.2	45.6	20	7.1	2.4	y	1.2	74	28.6	58.9	-6	28.3	-0.4
29	y	0.8	99	27.1	31.3	1	21.4	-13.3	y	-2.0	215	29.8	45.7	20	9.5	2.4	y	1.2	75	27.5	58.8	-6	28.7	-0.4
Jun 30	y	0.9	99	58.4	31.2	1	8.1	-13.4	y	-2.1	216	15.5	45.7	20	11.9	2.4	y	1.2	76	26.4	58.8	-6	29.1	-0.4
Jul 1	y	0.9	100	29.6	31.0	0	54.7	-13.5	y	-2.1	217	1.3	45.8	20	14.3	2.4	y	1.2	77	25.1	58.7	-6	29.5	-0.5
2	y	0.9	101	0.6	30.8	0	41.2	-13.6	y	-2.1	217	47.1	45.8	20	16.7	2.3	y	1.2	78	23.8	58.6	-6	30.0	-0.5
3	y	0.9	101	31.4	30.7	0	27.6	-13.5	y	-2.1	218	32.9	45.9	20	19.0	2.3	y	1.2	79	22.4	58.5	-6	30.5	-0.5
4	y	0.9	102	2.1	30.5	0	14.1	-13.7	y	-2.1	219	18.8	46.0	20	21.3	2.2	y	1.2	80	20.8	58.4	-6	31.0	-0.6
5	y	0.9	102	32.6	30.3	0	0.4	-13.7	y	-2.1	220	4.8	46.0	20	23.5	2.2	y	1.2	81	19.2	58.3	-6	31.6	-0.6
6	y	0.9	103	2.9	30.2	-0	13.3	-13.8	y	-2.1	220	50.8	46.1	20	25.7	2.2	y	1.2	82	17.5	58.2	-6	32.2	-0.7
7	y	0.9	103	33.1	30.0	-0	27.1	-13.8	y	-2.1	221	36.9	46.2	20	27.9	2.2	y	1.2	83	15.7	58.1	-6	32.9	-0.7
8	y	0.9	104	3.1	29.9	-0	40.9	-13.8	y	-2.1	222	23.1	46.2	20	30.1	2.1	y	1.2	84	13.8	58.0	-6	33.6	-0.7
9	y	0.9	104	33.0	29.7	-0	54.7	-14.0	y	-2.1	223	9.3	46.3	20	32.2	2.1	y	1.2	85	11.8	57.9	-6	34.3	-0.7
10	y	0.9	105	2.7	29.6	-1	8.7	-13.9	y	-2.1	223	55.6	46.4	20	34.3	2.1	y	1.2	86	9.8	57.8	-6	35.0	-0.8
11	y	0.9	105	32.3	29.4	-1	22.6	-14.0	y	-2.1	224	41.9	46.4	20	36.4	2.0	y	1.2	87	7.6	57.8	-6	35.8	-0.9
12	y	1.0	106	1.7	29.3	-1	36.6	-14.1	y	-2.1	225	28.3	46.5	20	38.4	2.1	y	1.3	88	5.4	57.7	-6	36.7	-0.8
Jul 13	y	1.0	106	30.9	29.1	-1	50.7	-14.1	y	-2.1	226	14.8	46.6	20	40.5	1.9	y	1.3	89	3.0	57.6	-6	37.5	-0.9

2012 Sun and Planets

Date	SUN GHA °	'	d '	Dec °	'	d '	Mercury vis	mag	GHA °	'	d '	dd '	Dec °	'	d '	dd '	Venus vis	mag	GHA °	'	d '	Dec °	'	d '
Jul 14	178	32.2	-1.6	21	38.7	-9.3	ss	1.7	158	7.2	60.4	-2.3	14	21.8	-14.6	-0.8	sr	-4.5	221	4.7	26.4	17	39.3	3.9
15	178	30.6	-1.5	21	29.4	-9.7	ss	1.8	159	7.7	65.1	-2.3	14	7.2	-13.0	-0.8	sr	-4.5	221	31.1	24.9	17	43.2	4.1
16	178	29.2	-1.3	21	19.7	-10.1	ss	1.9	160	12.8	69.8	-2.3	13	54.2	-11.3	-0.8	sr	-4.5	221	56.0	23.6	17	47.3	4.4
17	178	27.8	-1.2	21	9.6	-10.5	ss	2.0	161	22.5	74.3	-2.3	13	42.9	-9.6	-0.9	sr	-4.5	222	19.6	22.3	17	51.7	4.7
18	178	26.6	-1.1	20	59.1	-10.7	ss	2.1	162	36.9	78.8	-2.2	13	33.3	-7.6	-1.0	sr	-4.5	222	41.9	21.0	17	56.4	4.8
19	178	25.6	-0.9	20	48.4	-11.2	ss	2.2	163	55.6	83.0	-2.1	13	25.7	-5.7	-0.9	sr	-4.5	223	2.9	19.8	18	1.2	5.1
20	178	24.6	-0.8	20	37.2	-11.5	ss	2.3	165	18.7	87.1	-2.0	13	20.0	-3.7	-1.0	sr	-4.5	223	22.7	18.6	18	6.3	5.1
21	178	23.8	-0.7	20	25.7	-11.8	ss	2.4	166	45.8	90.8	-1.9	13	16.3	-1.7	-1.0	sr	-4.5	223	41.3	17.4	18	11.4	5.3
22	178	23.2	-0.5	20	13.9	-12.2	ss	2.5	168	16.6	94.2	-1.7	13	14.6	0.4	-1.0	sr	-4.5	223	58.7	16.3	18	16.7	5.4
23	178	22.7	-0.4	20	1.7	-12.5	ss	2.7	169	50.7	97.1	-1.4	13	15.0	2.4	-1.0	sr	-4.4	224	15.0	15.3	18	22.1	5.4
24	178	22.3	-0.2	19	49.2	-12.8		2.8	171	27.8	99.4	-1.2	13	17.4	4.5	-1.1	sr	-4.4	224	30.3	14.2	18	27.5	5.5
25	178	22.1	0.0	19	36.4	-13.1		2.9	173	7.2	101.2	-0.9	13	21.9	6.3	-0.9	sr	-4.4	224	44.5	13.2	18	33.0	5.5
26	178	22.1	0.1	19	23.3	-13.5		3.0	174	48.4	102.3	-0.6	13	28.2	8.2	-0.9	sr	-4.4	224	57.7	12.2	18	38.5	5.5
27	178	22.2	0.3	19	9.8	-13.8		3.1	176	30.7	102.7	-0.2	13	36.4	9.9	-0.9	sr	-4.4	225	10.0	11.3	18	44.0	5.4
28	178	22.4	0.4	18	56.0	-14.1		3.2	178	13.4	102.4	0.2	13	46.3	11.4	-0.8	sr	-4.4	225	21.3	10.4	18	49.4	5.4
29	178	22.9	0.6	18	41.9	-14.4		3.3	179	55.8	101.3	0.6	13	57.7	12.9	-0.8	sr	-4.4	225	31.6	9.5	18	54.8	5.3
30	178	23.4	0.7	18	27.5	-14.7		3.4	181	37.1	99.4	0.9	14	10.6	14.0	-0.6	sr	-4.4	225	41.1	8.6	19	0.1	5.2
Jul 31	178	24.2	0.9	18	12.8	-15.0		3.5	183	16.5	96.7	1.3	14	24.6	15.0	-0.5	sr	-4.4	225	49.7	7.8	19	5.3	5.1
Aug 1	178	25.0	1.0	17	57.8	-15.3		3.3	184	53.2	93.3	1.7	14	39.6	15.8	-0.4	sr	-4.4	225	57.4	6.9	19	10.4	4.9
2	178	26.1	1.2	17	42.5	-15.6	sr	3.1	186	26.5	89.2	2.0	14	55.4	16.4	-0.3	sr	-4.4	226	4.4	6.1	19	15.3	4.8
3	178	27.3	1.3	17	26.9	-15.8	sr	2.9	187	55.8	84.5	2.4	15	11.8	16.6	-0.1	sr	-4.4	226	10.5	5.4	19	20.1	4.6
4	178	28.6	1.5	17	11.1	-16.2	sr	2.6	189	20.3	79.2	2.6	15	28.4	16.8	-0.1	sr	-4.4	226	15.9	4.6	19	24.7	4.4
5	178	30.1	1.6	16	54.9	-16.4	sr	2.4	190	39.5	73.4	2.9	15	45.2	16.6	0.1	sr	-4.4	226	20.5	3.9	19	29.1	4.2
6	178	31.7	1.8	16	38.5	-16.7	sr	2.2	191	52.9	67.2	3.1	16	1.8	16.3	0.1	sr	-4.4	226	24.4	3.2	19	33.3	3.9
7	178	33.5	1.9	16	21.8	-16.9	sr	2.0	193	0.1	60.6	3.3	16	18.1	15.8	0.3	sr	-4.4	226	27.6	2.5	19	37.2	3.7
8	178	35.4	2.1	16	4.9	-17.3	sr	1.8	194	0.8	53.8	3.4	16	33.9	14.9	0.4	sr	-4.4	226	30.1	1.9	19	40.9	3.4
9	178	37.5	2.2	15	47.6	-17.4	sr	1.5	194	54.6	46.7	3.5	16	48.8	14.1	0.4	sr	-4.4	226	32.0	1.2	19	44.3	3.1
10	178	39.7	2.3	15	30.2	-17.7	sr	1.3	195	41.3	39.6	3.6	17	2.9	12.8	0.6	sr	-4.3	226	33.2	0.6	19	47.4	2.8
11	178	42.0	2.5	15	12.5	-18.0	sr	1.1	196	20.8	32.3	3.6	17	15.7	11.5	0.7	sr	-4.3	226	33.8	0.0	19	50.2	2.5
12	178	44.5	2.6	14	54.5	-18.2	sr	0.9	196	53.1	25.0	3.6	17	27.2	9.9	0.8	sr	-4.3	226	33.9	-0.5	19	52.7	2.2
13	178	47.1	2.7	14	36.3	-18.4	sr	0.7	197	18.2	17.8	3.6	17	37.1	8.2	0.8	sr	-4.3	226	33.4	-1.1	19	54.9	1.8
14	178	49.9	2.9	14	17.9	-18.7	sr	0.5	197	36.0	10.7	3.5	17	45.3	6.3	1.0	sr	-4.3	226	32.3	-1.6	19	56.7	1.5
15	178	52.8	3.0	13	59.2	-18.9	sr	0.3	197	46.8	3.8	3.5	17	51.6	4.1	1.1	sr	-4.3	226	30.7	-2.1	19	58.2	1.1
16	178	55.8	3.1	13	40.3	-19.1	sr	0.1	197	50.6	-2.9	3.4	17	55.7	2.0	1.0	sr	-4.3	226	28.6	-2.6	19	59.3	0.7
17	178	58.9	3.3	13	21.2	-19.3	sr	-0.1	197	47.6	-9.4	3.2	17	57.7	-0.5	1.3	sr	-4.3	226	26.0	-3.0	20	0.0	0.4
18	179	2.2	3.4	13	1.9	-19.5	sr	-0.2	197	38.2	-15.6	3.1	17	57.2	-3.0	1.3	sr	-4.3	226	23.0	-3.5	20	0.4	-0.1
19	179	5.6	3.5	12	42.4	-19.7	sr	-0.4	197	22.7	-21.4	2.9	17	54.2	-5.6	1.3	sr	-4.3	226	19.5	-3.9	20	0.3	-0.4
20	179	9.1	3.6	12	22.7	-19.9	sr	-0.5	197	1.3	-26.7	2.7	17	48.6	-8.5	1.4	sr	-4.3	226	15.7	-4.3	19	59.9	-0.9
21	179	12.7	3.8	12	2.8	-20.1	sr	-0.6	196	34.6	-31.7	2.5	17	40.1	-11.2	1.3	sr	-4.3	226	11.4	-4.7	19	59.0	-1.3
22	179	16.5	3.9	11	42.7	-20.3	sr	-0.7	196	2.9	-36.2	2.2	17	28.9	-14.1	1.5	sr	-4.3	226	6.7	-5.0	19	57.7	-1.8
23	179	20.4	4.0	11	22.4	-20.5	sr	-0.8	195	26.7	-40.2	2.0	17	14.8	-17.0	1.5	sr	-4.3	226	1.7	-5.4	19	55.9	-2.2
24	179	24.4	4.1	11	1.9	-20.6	sr	-0.9	194	46.5	-43.6	1.7	16	57.8	-19.9	1.5	sr	-4.3	225	56.3	-5.7	19	53.7	-2.6
25	179	28.4	4.2	10	41.3	-20.8	sr	-1.0	194	2.9	-46.5	1.5	16	37.9	-22.7	1.4	sr	-4.3	225	50.5	-6.0	19	51.1	-3.1
26	179	32.6	4.3	10	20.5	-21.0	sr	-1.1	193	16.4	-48.9	1.2	16	15.2	-25.4	1.4	sr	-4.3	225	44.5	-6.3	19	48.0	-3.5
27	179	36.9	4.4	9	59.5	-21.1	sr	-1.1	192	27.5	-50.8	0.9	15	49.8	-28.1	1.3	sr	-4.2	225	38.2	-6.6	19	44.5	-4.1
28	179	41.3	4.5	9	38.4	-21.3	sr	-1.2	191	36.7	-52.2	0.7	15	21.7	-30.5	1.2	sr	-4.2	225	31.5	-6.9	19	40.4	-4.5
29	179	45.8	4.6	9	17.1	-21.4	sr	-1.2	190	44.5	-53.1	0.5	14	51.2	-32.8	1.2	sr	-4.2	225	24.6	-7.2	19	35.9	-5.0
30	179	50.4	4.7	8	55.7	-21.6	sr	-1.3	189	51.4	-53.6	0.3	14	18.4	-35.0	1.1	sr	-4.2	225	17.5	-7.4	19	30.9	-5.4
Aug 31	179	55.1	4.7	8	34.1	-21.7	sr	-1.4	188	57.8	-53.7	0.1	13	43.4	-36.9	0.9	sr	-4.2	225	10.1	-7.6	19	25.5	-6.0
Sep 1	179	59.8	4.8	8	12.4	-21.8	sr	-1.4	188	4.1	-53.6	-0.1	13	6.5	-38.8	1.0	sr	-4.2	225	2.5	-7.8	19	19.5	-6.4
2	180	4.7	4.9	7	50.6	-21.9		-1.4	187	10.5	-53.1	-0.2	12	27.7	-40.3	0.8	sr	-4.2	224	54.7	-8.0	19	13.1	-6.9
3	180	9.6	5.0	7	28.7	-22.1		-1.5	186	17.4	-52.4	-0.3	11	47.4	-41.7	0.7	sr	-4.2	224	46.6	-8.2	19	6.2	-7.5
4	180	14.5	5.0	7	6.6	-22.2		-1.5	185	25.0	-51.5	-0.4	11	5.7	-43.0	0.7	sr	-4.2	224	38.4	-8.4	18	58.7	-7.9
5	180	19.5	5.1	6	44.4	-22.3		-1.6	184	33.5	-50.5	-0.5	10	22.7	-44.0	0.5	sr	-4.2	224	30.0	-8.5	18	50.8	-8.4
6	180	24.6	5.1	6	22.1	-22.5		-1.6	183	43.0	-49.4	-0.6	9	38.7	-44.9	0.5	sr	-4.2	224	21.5	-8.7	18	42.4	-9.0
7	180	29.7	5.2	5	59.6	-22.5		-1.7	182	53.6	-48.1	-0.6	8	53.8	-45.6	0.3	sr	-4.2	224	12.8	-8.8	18	33.4	-9.4
8	180	34.8	5.2	5	37.1	-22.6		-1.7	182	5.5	-46.9	-0.6	8	8.2	-46.2	0.3	sr	-4.2	224	4.0	-8.9	18	24.0	-9.9
9	180	40.0	5.2	5	14.5	-22.7		-1.7	181	18.6	-45.6	-0.6	7	22.0	-46.8	0.3	sr	-4.2	223	55.1	-9.0	18	14.1	-10.5
10	180	45.3	5.3	4	51.8	-22.8		-1.7	180	33.0	-44.3	-0.7	6	35.2	-47.1	0.1	sr	-4.2	223	46.0	-9.1	18	3.6	-10.9
11	180	50.5	5.3	4	29.0	-22.8		-1.7	179	48.8	-43.0	-0.7	5	48.1	-47.3	0.1	sr	-4.2	223	36.9	-9.2	17	52.7	-11.4
12	180	55.8	5.3	4	6.2	-23.0		-1.6	179	5.8	-41.7	-0.6	5	0.8	-47.6	0.2	sr	-4.2	223	27.7	-9.3	17	41.3	-11.9
13	181	1.1	5.3	3	43.2	-23.0		-1.5	178	24.1	-40.4	-0.6	4	13.2	-47.6	0.0	sr	-4.2	223	18.4	-9.3	17	29.4	-12.4
14	181	6.4	5.3	3	20.2	-23.1		-1.4	177	43.7	-39.2	-0.6	3	25.6	-47.6	0.0	sr	-4.2	223	9.1	-9.4	17	17.0	-12.9
15	181	11.7	5.3	2	57.1	-23.1		-1.3	177	4.5	-38.0	-0.6	2	38.0	-47.5	-0.1	sr	-4.2	222	59.8	-9.4	17	4.1	-13.4
Sep 16	181	17.1	5.3	2	34.0	-23.2		-1.3	176	26.5	-36.9	-0.6	1	50.5	-47.5	0.0	sr	-4.2	222	50.4	-9.4	16	50.7	-13.9

2012 Sun and Planets

Date	Mars vis	mag	GHA °	'	d '	Dec °	'	d '	Jupiter vis	mag	GHA °	'	d '	Dec °	'	d '	Saturn vis	mag	GHA °	'	d '	Dec °	'	d '
Jul 14	y	1.0	107	0.0	28.9	-2	4.8	-14.1	y	-2.1	227	1.4	46.6	20	42.4	2.0	y	1.3	90	0.6	57.5	-6	38.4	-1.0
15	y	1.0	107	29.0	28.8	-2	18.9	-14.2	y	-2.1	227	48.1	46.7	20	44.4	1.9	y	1.3	90	58.1	57.4	-6	39.4	-0.9
16	y	1.0	107	57.8	28.6	-2	33.1	-14.3	y	-2.1	228	34.8	46.8	20	46.3	1.9	y	1.3	91	55.5	57.3	-6	40.3	-1.0
17	y	1.0	108	26.4	28.5	-2	47.4	-14.2	y	-2.1	229	21.6	46.9	20	48.2	1.9	y	1.3	92	52.8	57.2	-6	41.3	-1.1
18	y	1.0	108	54.9	28.3	-3	1.6	-14.3	y	-2.1	230	8.5	47.0	20	50.1	1.8	y	1.3	93	50.0	57.1	-6	42.4	-1.0
19	y	1.0	109	23.2	28.2	-3	15.9	-14.4	y	-2.1	230	55.4	47.0	20	51.9	1.8	y	1.3	94	47.1	57.0	-6	43.4	-1.1
20	y	1.0	109	51.4	28.0	-3	30.3	-14.3	y	-2.1	231	42.5	47.1	20	53.7	1.8	y	1.3	95	44.1	56.9	-6	44.5	-1.2
21	y	1.0	110	19.4	27.9	-3	44.6	-14.4	y	-2.1	232	29.6	47.2	20	55.5	1.8	y	1.3	96	41.1	56.9	-6	45.7	-1.2
22	y	1.0	110	47.2	27.7	-3	59.0	-14.4	y	-2.1	233	16.8	47.3	20	57.3	1.7	y	1.3	97	37.9	56.8	-6	46.9	-1.2
23	y	1.0	111	15.0	27.6	-4	13.4	-14.5	y	-2.1	234	4.1	47.4	20	59.0	1.7	y	1.3	98	34.7	56.7	-6	48.1	-1.2
24	y	1.0	111	42.5	27.4	-4	27.9	-14.4	y	-2.1	234	51.5	47.5	21	0.7	1.7	y	1.3	99	31.4	56.6	-6	49.3	-1.2
25	y	1.0	112	9.9	27.3	-4	42.3	-14.5	y	-2.1	235	39.0	47.6	21	2.4	1.6	y	1.3	100	28.0	56.5	-6	50.5	-1.3
26	y	1.0	112	37.2	27.1	-4	56.8	-14.5	y	-2.1	236	26.6	47.7	21	4.0	1.6	y	1.3	101	24.5	56.4	-6	51.8	-1.4
27	y	1.1	113	4.3	27.0	-5	11.3	-14.6	y	-2.1	237	14.3	47.8	21	5.6	1.6	y	1.3	102	21.0	56.4	-6	53.2	-1.3
28	y	1.1	113	31.3	26.8	-5	25.9	-14.5	y	-2.1	238	2.1	47.9	21	7.2	1.5	y	1.3	103	17.3	56.3	-6	54.5	-1.4
29	y	1.1	113	58.1	26.7	-5	40.4	-14.6	y	-2.1	238	50.0	48.0	21	8.7	1.5	y	1.3	104	13.6	56.2	-6	55.9	-1.4
30	y	1.1	114	24.8	26.5	-5	55.0	-14.5	y	-2.2	239	38.0	48.1	21	10.2	1.5	y	1.3	105	9.8	56.1	-6	57.3	-1.5
Jul 31	y	1.1	114	51.3	26.4	-6	9.5	-14.6	y	-2.2	240	26.1	48.2	21	11.7	1.5	y	1.3	106	5.9	56.0	-6	58.8	-1.4
Aug 1	y	1.1	115	17.7	26.2	-6	24.1	-14.6	y	-2.2	241	14.3	48.3	21	13.2	1.4	y	1.3	107	1.9	55.9	-7	0.2	-1.5
2	y	1.1	115	43.9	26.1	-6	38.7	-14.6	y	-2.2	242	2.6	48.4	21	14.6	1.4	y	1.3	107	57.8	55.9	-7	1.7	-1.6
3	y	1.1	116	10.0	25.9	-6	53.3	-14.5	y	-2.2	242	51.0	48.5	21	16.0	1.4	y	1.3	108	53.7	55.8	-7	3.3	-1.5
4	y	1.1	116	36.0	25.8	-7	7.8	-14.6	y	-2.2	243	39.6	48.6	21	17.4	1.4	y	1.3	109	49.5	55.7	-7	4.8	-1.6
5	y	1.1	117	1.7	25.6	-7	22.4	-14.6	y	-2.2	244	28.2	48.8	21	18.8	1.3	y	1.3	110	45.2	55.6	-7	6.4	-1.6
6	y	1.1	117	27.4	25.5	-7	37.0	-14.6	y	-2.2	245	16.9	48.9	21	20.1	1.3	y	1.3	111	40.8	55.6	-7	8.0	-1.7
7	y	1.1	117	52.9	25.3	-7	51.6	-14.6	y	-2.2	246	5.8	49.0	21	21.4	1.3	y	1.3	112	36.4	55.5	-7	9.7	-1.6
8	y	1.1	118	18.2	25.2	-8	6.2	-14.5	y	-2.2	246	54.8	49.1	21	22.7	1.2	y	1.3	113	31.9	55.4	-7	11.3	-1.7
9	y	1.1	118	43.4	25.0	-8	20.7	-14.6	y	-2.2	247	43.9	49.2	21	23.9	1.2	y	1.3	114	27.3	55.3	-7	13.0	-1.7
10	y	1.1	119	8.4	24.9	-8	35.3	-14.5	y	-2.2	248	33.1	49.4	21	25.1	1.2	y	1.3	115	22.6	55.3	-7	14.7	-1.8
11	y	1.1	119	33.3	24.7	-8	49.8	-14.6	y	-2.2	249	22.5	49.5	21	26.3	1.2	y	1.3	116	17.9	55.2	-7	16.5	-1.8
12	y	1.1	119	58.0	24.6	-9	4.4	-14.5	y	-2.2	250	12.0	49.6	21	27.5	1.1	y	1.3	117	13.1	55.1	-7	18.3	-1.8
13	y	1.1	120	22.6	24.4	-9	18.9	-14.5	y	-2.2	251	1.6	49.7	21	28.6	1.1	y	1.3	118	8.2	55.0	-7	20.1	-1.8
14	y	1.1	120	46.9	24.2	-9	33.4	-14.5	y	-2.2	251	51.3	49.9	21	29.7	1.1	y	1.3	119	3.2	55.0	-7	21.9	-1.8
15	y	1.1	121	11.2	24.1	-9	47.9	-14.4	y	-2.2	252	41.2	50.0	21	30.8	1.1	y	1.3	119	58.2	54.9	-7	23.7	-1.9
16	y	1.1	121	35.3	23.9	-10	2.3	-14.5	y	-2.2	253	31.2	50.1	21	31.9	1.0	y	1.3	120	53.1	54.8	-7	25.6	-1.9
17	y	1.1	121	59.2	23.8	-10	16.8	-14.4	y	-2.2	254	21.3	50.3	21	32.9	1.0	y	1.3	121	47.9	54.8	-7	27.5	-1.9
18	y	1.2	122	22.9	23.6	-10	31.2	-14.4	y	-2.3	255	11.6	50.4	21	33.9	1.0	y	1.3	122	42.7	54.7	-7	29.4	-1.9
19	y	1.2	122	46.5	23.4	-10	45.6	-14.3	y	-2.3	256	2.1	50.6	21	34.9	0.9	y	1.3	123	37.4	54.6	-7	31.3	-2.0
20	y	1.2	123	10.0	23.3	-10	59.9	-14.3	y	-2.3	256	52.6	50.7	21	35.8	1.0	y	1.3	124	32.0	54.6	-7	33.3	-2.0
21	y	1.2	123	33.2	23.1	-11	14.2	-14.3	y	-2.3	257	43.3	50.9	21	36.8	0.9	y	1.3	125	26.6	54.5	-7	35.3	-2.0
22	y	1.2	123	56.3	22.9	-11	28.5	-14.2	y	-2.3	258	34.2	51.0	21	37.7	0.9	y	1.3	126	21.1	54.4	-7	37.3	-2.0
23	y	1.2	124	19.3	22.8	-11	42.7	-14.2	y	-2.3	259	25.2	51.2	21	38.6	0.8	y	1.4	127	15.5	54.4	-7	39.3	-2.0
24	y	1.2	124	42.0	22.6	-11	56.9	-14.2	y	-2.3	260	16.4	51.3	21	39.4	0.8	y	1.4	128	9.9	54.3	-7	41.3	-2.1
25	y	1.2	125	4.7	22.4	-12	11.1	-14.1	y	-2.3	261	7.7	51.5	21	40.2	0.8	y	1.4	129	4.2	54.2	-7	43.4	-2.1
26	y	1.2	125	27.1	22.3	-12	25.2	-14.0	y	-2.3	261	59.2	51.6	21	41.0	0.8	y	1.4	129	58.4	54.2	-7	45.5	-2.1
27	y	1.2	125	49.4	22.1	-12	39.2	-14.1	y	-2.3	262	50.8	51.8	21	41.8	0.8	y	1.4	130	52.6	54.1	-7	47.6	-2.1
28	y	1.2	126	11.5	22.0	-12	53.3	-13.9	y	-2.3	263	42.6	51.9	21	42.6	0.7	y	1.4	131	46.7	54.1	-7	49.7	-2.1
29	y	1.2	126	33.5	21.8	-13	7.2	-13.9	y	-2.3	264	34.6	52.1	21	43.3	0.7	y	1.4	132	40.8	54.0	-7	51.8	-2.2
30	y	1.2	126	55.2	21.6	-13	21.1	-13.8	y	-2.3	265	26.7	52.3	21	44.0	0.7	y	1.4	133	34.8	53.9	-7	54.0	-2.2
Aug 31	y	1.2	127	16.9	21.5	-13	34.9	-13.8	y	-2.3	266	19.0	52.4	21	44.7	0.7	y	1.4	134	28.7	53.9	-7	56.2	-2.2
Sep 1	y	1.2	127	38.3	21.3	-13	48.7	-13.7	y	-2.3	267	11.4	52.6	21	45.4	0.6	y	1.4	135	22.6	53.8	-7	58.4	-2.2
2	y	1.2	127	59.6	21.1	-14	2.4	-13.6	y	-2.3	268	4.0	52.8	21	46.0	0.6	y	1.4	136	16.4	53.8	-8	0.6	-2.2
3	y	1.2	128	20.7	20.9	-14	16.0	-13.6	y	-2.3	268	56.8	53.0	21	46.6	0.6	y	1.4	137	10.2	53.7	-8	2.8	-2.2
4	y	1.2	128	41.7	20.8	-14	29.6	-13.5	y	-2.4	269	49.7	53.1	21	47.2	0.6	y	1.4	138	4.0	53.7	-8	5.0	-2.3
5	y	1.2	129	2.4	20.6	-14	43.1	-13.4	y	-2.4	270	42.9	53.3	21	47.8	0.6	y	1.4	138	57.6	53.6	-8	7.3	-2.2
6	y	1.2	129	23.0	20.4	-14	56.5	-13.3	y	-2.4	271	36.2	53.5	21	48.4	0.5	y	1.4	139	51.3	53.6	-8	9.5	-2.3
7	y	1.2	129	43.5	20.2	-15	9.8	-13.3	y	-2.4	272	29.7	53.7	21	48.9	0.5	y	1.4	140	44.8	53.5	-8	11.8	-2.3
8	y	1.2	130	3.7	20.1	-15	23.1	-13.1	y	-2.4	273	23.3	53.8	21	49.4	0.5	y	1.3	141	38.3	53.5	-8	14.1	-2.3
9	y	1.2	130	23.8	19.9	-15	36.2	-13.1	y	-2.4	274	17.2	54.0	21	49.9	0.4	y	1.3	142	31.8	53.4	-8	16.4	-2.4
10	y	1.2	130	43.6	19.7	-15	49.3	-13.0	y	-2.4	275	11.2	54.2	21	50.3	0.5	y	1.3	143	25.2	53.4	-8	18.8	-2.3
11	y	1.2	131	3.3	19.5	-16	2.3	-12.9	y	-2.4	276	5.4	54.4	21	50.8	0.4	y	1.3	144	18.6	53.3	-8	21.1	-2.3
12	y	1.2	131	22.9	19.3	-16	15.2	-12.8	y	-2.4	276	59.8	54.6	21	51.2	0.4	y	1.3	145	11.9	53.3	-8	23.4	-2.4
13	y	1.2	131	42.2	19.2	-16	28.0	-12.7	y	-2.4	277	54.4	54.8	21	51.6	0.4	y	1.3	146	5.2	53.2	-8	25.8	-2.4
14	y	1.2	132	1.4	19.0	-16	40.7	-12.6	y	-2.4	278	49.2	55.0	21	52.0	0.3	y	1.3	146	58.4	53.2	-8	28.2	-2.4
15	y	1.2	132	20.3	18.8	-16	53.3	-12.5	y	-2.4	279	44.2	55.2	21	52.3	0.4	y	1.3	147	51.6	53.1	-8	30.6	-2.4
Sep 16	y	1.2	132	39.1	18.6	-17	5.8	-12.4	y	-2.4	280	39.3	55.4	21	52.7	0.3	y	1.3	148	44.8	53.1	-8	33.0	-2.4

2012 Sun and Planets

Date	SUN GHA °	'	d '	Dec °	'	d '	Mercury vis	mag	GHA °	'	d '	dd '	Dec °	'	d '	dd '	Venus vis	mag	GHA °	'	d '	Dec °	'	d '
Sep 17	181	22.4	5.3	2	10.8	-23.2		-1.2	175	49.6	-35.8	-0.5	1	3.0	-47.2	-0.1	sr	-4.1	222	41.0	-9.4	16	36.8	-14.3
18	181	27.7	5.3	1	47.6	-23.2		-1.1	175	13.8	-34.7	-0.5	0	15.8	-47.0	-0.1	sr	-4.1	222	31.6	-9.4	16	22.5	-14.8
19	181	33.1	5.3	1	24.4	-23.3		-1.0	174	39.1	-33.8	-0.5	-0	31.2	-46.7	-0.1	sr	-4.1	222	22.1	-9.4	16	7.7	-15.3
20	181	38.4	5.3	1	1.1	-23.3	ss	-0.9	174	5.3	-32.8	-0.5	-1	17.9	-46.4	-0.2	sr	-4.1	222	12.7	-9.4	15	52.4	-15.7
21	181	43.7	5.3	0	37.8	-23.4	ss	-0.9	173	32.5	-31.9	-0.4	-2	4.3	-46.1	-0.1	sr	-4.1	222	3.3	-9.4	15	36.7	-16.2
22	181	49.0	5.3	0	14.4	-23.3	ss	-0.8	173	0.6	-31.1	-0.4	-2	50.4	-45.6	-0.3	sr	-4.1	221	53.9	-9.4	15	20.5	-16.7
23	181	54.2	5.2	-0	8.9	-23.4	ss	-0.7	172	29.5	-30.3	-0.4	-3	36.0	-45.2	-0.2	sr	-4.1	221	44.6	-9.3	15	3.8	-17.1
24	181	59.5	5.2	-0	32.3	-23.4	ss	-0.7	171	59.2	-29.6	-0.4	-4	21.2	-44.8	-0.2	sr	-4.1	221	35.2	-9.3	14	46.7	-17.5
25	182	4.7	5.2	-0	55.7	-23.3	ss	-0.6	171	29.6	-28.9	-0.4	-5	6.0	-44.3	-0.3	sr	-4.1	221	25.9	-9.3	14	29.2	-18.0
26	182	9.9	5.1	-1	19.0	-23.4	ss	-0.6	171	0.7	-28.2	-0.3	-5	50.3	-43.7	-0.3	sr	-4.1	221	16.7	-9.2	14	11.2	-18.4
27	182	15.0	5.1	-1	42.4	-23.3	ss	-0.6	170	32.5	-27.6	-0.3	-6	34.0	-43.3	-0.2	sr	-4.1	221	7.5	-9.2	13	52.8	-18.8
28	182	20.1	5.0	-2	5.7	-23.3	ss	-0.5	170	4.9	-27.0	-0.3	-7	17.3	-42.6	-0.4	sr	-4.1	220	58.3	-9.1	13	34.0	-19.2
29	182	25.1	5.0	-2	29.0	-23.3	ss	-0.5	169	37.9	-26.5	-0.3	-7	59.9	-42.1	-0.3	sr	-4.1	220	49.2	-9.1	13	14.8	-19.6
Sep 30	182	30.0	4.9	-2	52.3	-23.3	ss	-0.4	169	11.5	-26.0	-0.3	-8	42.0	-41.5	-0.3	sr	-4.1	220	40.1	-9.0	12	55.2	-20.1
Oct 1	182	34.9	4.8	-3	15.6	-23.2	ss	-0.4	168	45.5	-25.5	-0.2	-9	23.5	-40.8	-0.4	sr	-4.1	220	31.1	-9.0	12	35.1	-20.4
2	182	39.8	4.7	-3	38.8	-23.2	ss	-0.4	168	20.0	-25.0	-0.2	-10	4.3	-40.2	-0.3	sr	-4.1	220	22.1	-8.9	12	14.7	-20.8
3	182	44.5	4.7	-4	2.0	-23.2	ss	-0.3	167	55.0	-24.6	-0.2	-10	44.5	-39.5	-0.4	sr	-4.1	220	13.2	-8.9	11	53.9	-21.2
4	182	49.2	4.6	-4	25.2	-23.1	ss	-0.3	167	30.4	-24.2	-0.2	-11	24.0	-38.9	-0.3	sr	-4.1	220	4.3	-8.8	11	32.7	-21.5
5	182	53.7	4.5	-4	48.3	-23.0	ss	-0.3	167	6.3	-23.7	-0.2	-12	2.9	-38.1	-0.4	sr	-4.1	219	55.5	-8.7	11	11.2	-21.9
6	182	58.2	4.4	-5	11.3	-23.0	ss	-0.3	166	42.5	-23.3	-0.2	-12	41.0	-37.4	-0.4	sr	-4.1	219	46.8	-8.7	10	49.3	-22.3
7	183	2.5	4.3	-5	34.3	-22.9	ss	-0.3	166	19.2	-23.0	-0.2	-13	18.4	-36.6	-0.4	sr	-4.1	219	38.1	-8.6	10	27.0	-22.5
8	183	6.8	4.1	-5	57.2	-22.8	ss	-0.2	165	56.2	-22.6	-0.2	-13	55.0	-35.9	-0.4	sr	-4.1	219	29.5	-8.6	10	4.5	-22.9
9	183	11.0	4.0	-6	20.0	-22.8	ss	-0.2	165	33.7	-22.1	-0.2	-14	30.9	-35.0	-0.4	sr	-4.1	219	20.9	-8.5	9	41.6	-23.3
10	183	15.0	3.9	-6	42.8	-22.6	ss	-0.2	165	11.5	-21.7	-0.2	-15	5.9	-34.2	-0.4	sr	-4.1	219	12.3	-8.5	9	18.3	-23.5
11	183	18.9	3.8	-7	5.4	-22.6	ss	-0.2	164	49.8	-21.3	-0.2	-15	40.1	-33.4	-0.4	sr	-4.1	219	3.9	-8.4	8	54.8	-23.8
12	183	22.7	3.7	-7	28.0	-22.5	ss	-0.2	164	28.5	-20.8	-0.2	-16	13.5	-32.5	-0.5	sr	-4.1	218	55.5	-8.4	8	31.0	-24.2
13	183	26.3	3.5	-7	50.5	-22.3	ss	-0.2	164	7.7	-20.3	-0.3	-16	46.0	-31.6	-0.5	sr	-4.1	218	47.1	-8.3	8	6.8	-24.4
14	183	29.8	3.4	-8	12.8	-22.2	ss	-0.2	163	47.4	-19.8	-0.3	-17	17.6	-30.6	-0.5	sr	-4.1	218	38.8	-8.3	7	42.4	-24.6
15	183	33.2	3.2	-8	35.0	-22.2	ss	-0.2	163	27.6	-19.1	-0.3	-17	48.2	-29.7	-0.5	sr	-4.1	218	30.5	-8.2	7	17.8	-25.0
16	183	36.5	3.1	-8	57.2	-22.0	ss	-0.2	163	8.5	-18.5	-0.3	-18	17.9	-28.7	-0.5	sr	-4.1	218	22.3	-8.2	6	52.8	-25.1
17	183	39.6	2.9	-9	19.2	-21.8	ss	-0.2	162	50.0	-17.7	-0.4	-18	46.6	-27.6	-0.5	sr	-4.1	218	14.1	-8.2	6	27.7	-25.4
18	183	42.5	2.8	-9	41.0	-21.7	ss	-0.2	162	32.3	-16.8	-0.4	-19	14.2	-26.6	-0.5	sr	-4.1	218	5.9	-8.1	6	2.3	-25.7
19	183	45.3	2.6	-10	2.7	-21.6	ss	-0.1	162	15.5	-15.9	-0.5	-19	40.8	-25.5	-0.5	sr	-4.1	217	57.8	-8.1	5	36.6	-25.8
20	183	47.9	2.5	-10	24.3	-21.4	ss	-0.1	161	59.6	-14.8	-0.6	-20	6.3	-24.3	-0.6	sr	-4.0	217	49.7	-8.1	5	10.8	-26.0
21	183	50.4	2.3	-10	45.7	-21.2	ss	-0.1	161	44.9	-13.5	-0.6	-20	30.6	-23.1	-0.6	sr	-4.0	217	41.7	-8.0	4	44.8	-26.3
22	183	52.7	2.2	-11	6.9	-21.1	ss	-0.1	161	31.3	-12.1	-0.7	-20	53.7	-21.9	-0.6	sr	-4.0	217	33.6	-8.0	4	18.5	-26.4
23	183	54.9	2.0	-11	28.0	-20.9	ss	-0.1	161	19.3	-10.5	-0.8	-21	15.6	-20.6	-0.6	sr	-4.0	217	25.6	-8.0	3	52.1	-26.6
24	183	56.9	1.8	-11	48.9	-20.8	ss	-0.1	161	8.8	-8.6	-0.9	-21	36.2	-19.3	-0.7	sr	-4.0	217	17.6	-8.0	3	25.5	-26.7
25	183	58.7	1.6	-12	9.7	-20.5	ss	-0.1	161	0.2	-6.5	-1.0	-21	55.5	-17.8	-0.8	sr	-4.0	217	9.5	-8.0	2	58.8	-26.9
26	184	0.3	1.5	-12	30.2	-20.3	ss	-0.1	160	53.6	-4.1	-1.2	-22	13.3	-16.4	-0.7	sr	-4.0	217	1.5	-8.0	2	31.9	-27.0
27	184	1.8	1.3	-12	50.5	-20.2	ss	-0.1	160	49.5	-1.4	-1.4	-22	29.7	-14.8	-0.8	sr	-4.0	216	53.5	-8.1	2	4.9	-27.2
28	184	3.1	1.1	-13	10.7	-19.9	ss	-0.1	160	48.1	1.7	-1.5	-22	44.5	-13.2	-0.8	sr	-4.0	216	45.4	-8.1	1	37.7	-27.3
29	184	4.2	0.9	-13	30.6	-19.8	ss	-0.1	160	49.7	5.1	-1.7	-22	57.7	-11.5	-0.9	sr	-4.0	216	37.3	-8.1	1	10.4	-27.3
30	184	5.1	0.7	-13	50.4	-19.5	ss	-0.1	160	54.9	9.1	-2.0	-23	9.2	-9.6	-1.0	sr	-4.0	216	29.1	-8.2	0	43.1	-27.5
Oct 31	184	5.8	0.5	-14	9.9	-19.3	ss	0.0	161	4.0	13.5	-2.2	-23	18.8	-7.7	-1.0	sr	-4.0	216	21.0	-8.2	0	15.6	-27.5
Nov 1	184	6.3	0.3	-14	29.2	-19.0	ss	0.0	161	17.5	18.6	-2.5	-23	26.5	-5.7	-1.0	sr	-4.0	216	12.7	-8.3	-0	11.9	-27.6
2	184	6.6	0.1	-14	48.2	-18.8	ss	0.1	161	36.1	24.2	-2.8	-23	32.2	-3.5	-1.1	sr	-4.0	216	4.4	-8.4	-0	39.5	-27.7
3	184	6.7	-0.1	-15	7.0	-18.6	ss	0.1	162	0.2	30.4	-3.1	-23	35.7	-1.2	-1.1	sr	-4.0	215	56.1	-8.4	-1	7.2	-27.7
4	184	6.6	-0.3	-15	25.6	-18.3	ss	0.2	162	30.7	37.4	-3.5	-23	36.9	1.3	-1.3	sr	-4.0	215	47.6	-8.5	-1	34.9	-27.8
5	184	6.3	-0.5	-15	43.9	-18.0	ss	0.3	163	8.0	45.0	-3.8	-23	35.6	4.0	-1.3	sr	-4.0	215	39.1	-8.6	-2	2.7	-27.7
6	184	5.7	-0.7	-16	1.9	-17.8	ss	0.4	163	53.1	53.4	-4.2	-23	31.6	6.9	-1.4	sr	-4.0	215	30.5	-8.7	-2	30.4	-27.8
7	184	5.0	-1.0	-16	19.7	-17.5	ss	0.5	164	46.4	62.4	-4.5	-23	24.7	9.9	-1.5	sr	-4.0	215	21.8	-8.8	-2	58.2	-27.8
8	184	4.0	-1.2	-16	37.2	-17.3	ss	0.7	165	48.8	71.9	-4.8	-23	14.8	13.3	-1.7	sr	-4.0	215	13.0	-8.9	-3	26.0	-27.7
9	184	2.9	-1.4	-16	54.5	-16.9	ss	0.9	167	0.7	81.9	-5.0	-23	1.5	16.7	-1.7	sr	-4.0	215	4.1	-9.0	-3	53.7	-27.7
10	184	1.5	-1.6	-17	11.4	-16.7	ss	1.2	168	22.7	92.1	-5.1	-22	44.8	20.3	-1.8	sr	-4.0	214	55.0	-9.2	-4	21.4	-27.7
11	183	59.9	-1.8	-17	28.1	-16.3	ss	1.4	169	54.8	102.2	-5.0	-22	24.5	23.9	-1.8	sr	-4.0	214	45.8	-9.3	-4	49.1	-27.6
12	183	58.1	-2.0	-17	44.4	-16.1	ss	1.6	171	37.0	111.8	-4.8	-22	0.6	27.6	-1.8	sr	-4.0	214	36.5	-9.5	-5	16.7	-27.5
13	183	56.0	-2.3	-18	0.5	-15.7	ss	1.8	173	28.8	120.6	-4.4	-21	33.0	31.1	-1.8	sr	-4.0	214	27.1	-9.6	-5	44.2	-27.5
14	183	53.8	-2.5	-18	16.2	-15.4	ss	2.0	175	29.4	127.9	-3.7	-21	1.9	34.1	-1.5	sr	-4.0	214	17.5	-9.8	-6	11.7	-27.4
15	183	51.3	-2.7	-18	31.6	-15.1		2.3	177	37.3	133.4	-2.7	-20	27.8	36.6	-1.2	sr	-4.0	214	7.7	-9.9	-6	39.1	-27.2
16	183	48.6	-2.9	-18	46.7	-14.8		2.5	179	50.6	136.6	-1.6	-19	51.2	38.3	-0.9	sr	-4.0	213	57.8	-10.1	-7	6.3	-27.2
17	183	45.8	-3.1	-19	1.5	-14.4		2.7	182	7.3	137.3	-0.4	-19	12.9	39.0	-0.3	sr	-4.0	213	47.7	-10.3	-7	33.5	-27.0
18	183	42.7	-3.3	-19	15.9	-14.0		2.7	184	24.6	135.5	0.9	-18	33.9	38.6	0.2	sr	-4.0	213	37.4	-10.5	-8	0.5	-26.9
19	183	39.4	-3.5	-19	29.9	-13.8		2.5	186	40.1	131.1	2.2	-17	55.3	37.0	0.8	sr	-4.0	213	27.0	-10.7	-8	27.4	-26.7
Nov 20	183	35.9	-3.7	-19	43.7	-13.3		2.2	188	51.1	124.4	3.3	-17	18.3	34.3	1.4	sr	-4.0	213	16.3	-10.8	-8	54.1	-26.5

2012 Sun and Planets

Date	Mars vis	mag	GHA °	'	d '	Dec °	'	d '	Jupiter vis	mag	GHA °	'	d '	Dec °	'	d '	Saturn vis	mag	GHA °	'	d '	Dec °	'	d '
Sep 17	y	1.2	132	57.8	18.4	-17	18.2	-12.3	y	-2.4	281	34.7	55.6	21	53.0	0.3	y	1.3	149	37.9	53.1	-8	35.4	-2.4
18	y	1.2	133	16.2	18.2	-17	30.5	-12.2	y	-2.4	282	30.3	55.8	21	53.3	0.3	y	1.3	150	30.9	53.0	-8	37.8	-2.4
19	y	1.2	133	34.4	18.1	-17	42.7	-12.0	y	-2.5	283	26.1	56.0	21	53.6	0.2	y	1.3	151	24.0	53.0	-8	40.2	-2.4
20	y	1.2	133	52.5	17.9	-17	54.7	-12.0	y	-2.5	284	22.0	56.2	21	53.8	0.2	y	1.3	152	16.9	52.9	-8	42.6	-2.5
21	y	1.2	134	10.4	17.7	-18	6.7	-11.8	y	-2.5	285	18.2	56.4	21	54.0	0.3	y	1.3	153	9.9	52.9	-8	45.1	-2.4
22	y	1.2	134	28.0	17.5	-18	18.5	-11.7	y	-2.5	286	14.6	56.6	21	54.3	0.2	y	1.3	154	2.8	52.9	-8	47.5	-2.5
23	y	1.2	134	45.6	17.3	-18	30.2	-11.6	y	-2.5	287	11.2	56.8	21	54.5	0.1	y	1.3	154	55.7	52.8	-8	50.0	-2.5
24	y	1.2	135	2.9	17.1	-18	41.8	-11.4	y	-2.5	288	8.0	57.0	21	54.6	0.2	y	1.3	155	48.5	52.8	-8	52.5	-2.4
25	y	1.2	135	20.0	17.0	-18	53.2	-11.3	y	-2.5	289	5.0	57.2	21	54.8	0.1	y	1.3	156	41.3	52.8	-8	54.9	-2.5
26	y	1.2	135	37.0	16.8	-19	4.5	-11.1	y	-2.5	290	2.2	57.4	21	54.9	0.1	y	1.3	157	34.1	52.7	-8	57.4	-2.5
27	y	1.2	135	53.8	16.6	-19	15.6	-11.1	y	-2.5	290	59.6	57.6	21	55.0	0.1	y	1.3	158	26.8	52.7	-8	59.9	-2.5
28	y	1.2	136	10.4	16.4	-19	26.7	-10.8	y	-2.5	291	57.3	57.8	21	55.1	0.1	y	1.3	159	19.5	52.7	-9	2.4	-2.5
29	y	1.2	136	26.8	16.2	-19	37.5	-10.8	y	-2.5	292	55.1	58.1	21	55.2	0.1	y	1.3	160	12.2	52.6	-9	4.9	-2.5
Sep 30	y	1.2	136	43.1	16.1	-19	48.3	-10.5	y	-2.5	293	53.1	58.3	21	55.3	0.0	y	1.3	161	4.8	52.6	-9	7.4	-2.5
Oct 1	y	1.2	136	59.1	15.9	-19	58.8	-10.4	y	-2.5	294	51.4	58.5	21	55.3	0.0	y	1.3	161	57.4	52.6	-9	9.9	-2.5
2	y	1.2	137	15.0	15.7	-20	9.2	-10.3	y	-2.5	295	49.9	58.7	21	55.3	0.0	y	1.3	162	50.0	52.6	-9	12.4	-2.5
3	y	1.2	137	30.7	15.5	-20	19.5	-10.1	y	-2.6	296	48.6	58.9	21	55.3	0.0	y	1.3	163	42.6	52.5	-9	14.9	-2.5
4	y	1.2	137	46.3	15.3	-20	29.6	-10.0	y	-2.6	297	47.5	59.1	21	55.3	-0.1	y	1.3	164	35.1	52.5	-9	17.4	-2.5
5	y	1.2	138	1.6	15.2	-20	39.6	-9.7	y	-2.6	298	46.6	59.3	21	55.2	0.0	y	1.3	165	27.6	52.5	-9	19.9	-2.6
6	y	1.2	138	16.8	15.0	-20	49.3	-9.7	y	-2.6	299	46.0	59.6	21	55.2	-0.1	y	1.3	166	20.1	52.5	-9	22.5	-2.5
7	y	1.2	138	31.8	14.8	-20	59.0	-9.4	y	-2.6	300	45.5	59.8	21	55.1	-0.1	y	1.3	167	12.5	52.4	-9	25.0	-2.5
8	y	1.2	138	46.6	14.6	-21	8.4	-9.3	y	-2.6	301	45.3	60.0	21	55.0	-0.1	y	1.3	168	5.0	52.4	-9	27.5	-2.5
9	y	1.2	139	1.2	14.4	-21	17.7	-9.1	y	-2.6	302	45.3	60.2	21	54.9	-0.2	y	1.3	168	57.4	52.4	-9	30.0	-2.6
10	y	1.2	139	15.6	14.3	-21	26.8	-8.9	y	-2.6	303	45.5	60.4	21	54.7	-0.1	y	1.3	169	49.8	52.4	-9	32.6	-2.5
11	y	1.2	139	29.9	14.1	-21	35.7	-8.7	y	-2.6	304	45.9	60.6	21	54.6	-0.2	y	1.3	170	42.2	52.4	-9	35.1	-2.5
12	y	1.2	139	44.0	13.9	-21	44.4	-8.5	y	-2.6	305	46.5	60.9	21	54.4	-0.2	y	1.3	171	34.5	52.3	-9	37.6	-2.6
13	y	1.2	139	57.9	13.7	-21	52.9	-8.4	y	-2.6	306	47.4	61.1	21	54.2	-0.2	y	1.3	172	26.9	52.3	-9	40.2	-2.5
14	y	1.2	140	11.6	13.6	-22	1.3	-8.1	y	-2.6	307	48.5	61.3	21	54.0	-0.2	y	1.3	173	19.2	52.3	-9	42.7	-2.5
15	y	1.2	140	25.2	13.4	-22	9.4	-8.0	y	-2.6	308	49.8	61.5	21	53.8	-0.3	y	1.3	174	11.5	52.3	-9	45.2	-2.5
16	y	1.2	140	38.6	13.2	-22	17.4	-7.8	y	-2.6	309	51.3	61.7	21	53.5	-0.3	y	1.3	175	3.8	52.3	-9	47.7	-2.6
17	y	1.2	140	51.8	13.1	-22	25.2	-7.5	y	-2.6	310	53.0	61.9	21	53.2	-0.2	y	1.3	175	56.1	52.3	-9	50.3	-2.5
18	y	1.2	141	4.9	12.9	-22	32.7	-7.4	y	-2.7	311	54.9	62.1	21	53.0	-0.4		1.3	176	48.3	52.3	-9	52.8	-2.5
19	y	1.2	141	17.8	12.7	-22	40.1	-7.1	y	-2.7	312	57.1	62.4	21	52.6	-0.3		1.3	177	40.6	52.2	-9	55.3	-2.5
20	y	1.2	141	30.5	12.6	-22	47.2	-7.0	y	-2.7	313	59.4	62.6	21	52.3	-0.3		1.3	178	32.8	52.2	-9	57.8	-2.5
21	y	1.2	141	43.1	12.4	-22	54.2	-6.7	y	-2.7	315	2.0	62.8	21	52.0	-0.4		1.3	179	25.1	52.2	-10	0.3	-2.5
22	y	1.2	141	55.5	12.3	-23	0.9	-6.5	y	-2.7	316	4.8	63.0	21	51.6	-0.4		1.3	180	17.3	52.2	-10	2.8	-2.5
23	y	1.2	142	7.8	12.1	-23	7.4	-6.3	y	-2.7	317	7.7	63.2	21	51.2	-0.4		1.2	181	9.5	52.2	-10	5.3	-2.5
24	y	1.2	142	19.9	12.0	-23	13.7	-6.1	y	-2.7	318	10.9	63.4	21	50.8	-0.4		1.2	182	1.7	52.2	-10	7.8	-2.5
25	y	1.2	142	31.9	11.8	-23	19.8	-5.8	y	-2.7	319	14.3	63.6	21	50.4	-0.5		1.2	182	54.0	52.2	-10	10.3	-2.5
26	y	1.2	142	43.7	11.7	-23	25.6	-5.6	y	-2.7	320	17.8	63.8	21	49.9	-0.4		1.2	183	46.2	52.2	-10	12.8	-2.5
27	y	1.2	142	55.4	11.5	-23	31.2	-5.4	y	-2.7	321	21.6	64.0	21	49.5	-0.5		1.2	184	38.4	52.2	-10	15.3	-2.4
28	y	1.2	143	7.0	11.4	-23	36.6	-5.2	y	-2.7	322	25.6	64.1	21	49.0	-0.5		1.3	185	30.6	52.2	-10	17.7	-2.5
29	y	1.2	143	18.4	11.3	-23	41.8	-4.9	y	-2.7	323	29.7	64.3	21	48.5	-0.5		1.3	186	22.8	52.2	-10	20.2	-2.5
30	y	1.2	143	29.7	11.1	-23	46.7	-4.7	y	-2.7	324	34.0	64.5	21	48.0	-0.6		1.3	187	15.0	52.2	-10	22.7	-2.4
Oct 31	y	1.2	143	40.8	11.0	-23	51.4	-4.5	y	-2.7	325	38.5	64.7	21	47.4	-0.5		1.3	188	7.2	52.2	-10	25.1	-2.4
Nov 1	y	1.2	143	51.8	10.9	-23	55.9	-4.2	y	-2.7	326	43.2	64.9	21	46.9	-0.6		1.3	188	59.4	52.2	-10	27.5	-2.5
2	y	1.2	144	2.7	10.8	-24	0.1	-3.9	y	-2.7	327	48.1	65.0	21	46.3	-0.6		1.3	189	51.7	52.2	-10	30.0	-2.4
3	y	1.2	144	13.5	10.6	-24	4.0	-3.8	y	-2.7	328	53.1	65.2	21	45.7	-0.6		1.3	190	43.9	52.2	-10	32.4	-2.4
4	y	1.2	144	24.1	10.5	-24	7.8	-3.4	y	-2.8	329	58.3	65.4	21	45.1	-0.6		1.3	191	36.1	52.2	-10	34.8	-2.4
5	y	1.2	144	34.6	10.4	-24	11.2	-3.3	y	-2.8	331	3.7	65.5	21	44.5	-0.7	y	1.3	192	28.3	52.2	-10	37.2	-2.4
6	y	1.2	144	45.0	10.3	-24	14.5	-3.0	y	-2.8	332	9.2	65.7	21	43.8	-0.6	y	1.3	193	20.6	52.3	-10	39.6	-2.4
7	y	1.2	144	55.3	10.2	-24	17.5	-2.7	y	-2.8	333	14.9	65.9	21	43.2	-0.7	y	1.3	194	12.8	52.3	-10	42.0	-2.4
8	y	1.2	145	5.5	10.1	-24	20.2	-2.4	y	-2.8	334	20.8	66.0	21	42.5	-0.7	y	1.3	195	5.1	52.3	-10	44.4	-2.3
9	y	1.2	145	15.6	10.0	-24	22.6	-2.3	y	-2.8	335	26.8	66.1	21	41.8	-0.7	y	1.3	195	57.4	52.3	-10	46.7	-2.4
10	y	1.2	145	25.6	9.9	-24	24.9	-1.9	y	-2.8	336	32.9	66.3	21	41.1	-0.8	y	1.3	196	49.7	52.3	-10	49.1	-2.3
11	y	1.2	145	35.4	9.8	-24	26.8	-1.7	y	-2.8	337	39.2	66.4	21	40.3	-0.7	y	1.3	197	42.0	52.3	-10	51.4	-2.4
12	y	1.2	145	45.2	9.7	-24	28.5	-1.4	y	-2.8	338	45.6	66.6	21	39.6	-0.8	y	1.3	198	34.3	52.3	-10	53.8	-2.3
13	y	1.2	145	54.9	9.6	-24	29.9	-1.2	y	-2.8	339	52.2	66.7	21	38.8	-0.8	y	1.3	199	26.6	52.3	-10	56.1	-2.3
14	y	1.2	146	4.5	9.5	-24	31.1	-0.9	y	-2.8	340	58.9	66.8	21	38.0	-0.8	y	1.3	200	19.0	52.4	-10	58.4	-2.3
15	y	1.2	146	14.1	9.4	-24	32.0	-0.6	y	-2.8	342	5.7	66.9	21	37.2	-0.8	y	1.3	201	11.3	52.4	-11	0.7	-2.2
16	y	1.2	146	23.5	9.4	-24	32.6	-0.4	y	-2.8	343	12.6	67.0	21	36.4	-0.8	y	1.3	202	3.7	52.4	-11	2.9	-2.3
17	y	1.2	146	32.9	9.3	-24	33.0	-0.1	y	-2.8	344	19.6	67.1	21	35.6	-0.8	y	1.3	202	56.1	52.4	-11	5.2	-2.2
18	y	1.2	146	42.2	9.3	-24	33.1	0.1	y	-2.8	345	26.7	67.2	21	34.8	-0.9	y	1.3	203	48.5	52.5	-11	7.4	-2.3
19	y	1.2	146	51.5	9.2	-24	33.0	0.5	y	-2.8	346	33.9	67.3	21	33.9	-0.9	y	1.3	204	41.0	52.5	-11	9.7	-2.2
Nov 20	y	1.2	147	0.7	9.1	-24	32.5	0.7	y	-2.8	347	41.2	67.4	21	33.0	-0.8	y	1.3	205	33.5	52.5	-11	11.9	-2.2

2012 Sun and Planets

Date	SUN GHA °	'	d '	Dec °	'	d '	Mercury vis	mag	GHA °	'	d '	dd '	Dec °	'	d '	dd '	Venus vis	mag	GHA °	'	d '	Dec °	'	d '
Nov 21	183	32.2	-3.9	-19	57.0	-13.0		1.9	190	55.6	116.0	4.2	-16	44.0	30.8	1.8	sr	-4.0	213	5.5	-11.1	-9	20.6	-26.3
22	183	28.3	-4.1	-20	10.0	-12.6	sr	1.7	192	51.6	106.1	4.9	-16	13.2	26.4	2.2	sr	-4.0	212	54.4	-11.3	-9	46.9	-26.2
23	183	24.3	-4.3	-20	22.6	-12.3	sr	1.4	194	37.7	95.5	5.3	-15	46.8	21.5	2.5	sr	-4.0	212	43.1	-11.5	-10	13.1	-25.9
24	183	20.0	-4.4	-20	34.9	-11.8	sr	1.2	196	13.1	84.4	5.5	-15	25.3	16.5	2.5	sr	-4.0	212	31.6	-11.7	-10	39.0	-25.7
25	183	15.6	-4.6	-20	46.7	-11.5	sr	0.9	197	37.5	73.3	5.5	-15	8.8	11.4	2.5	sr	-4.0	212	19.9	-12.0	-11	4.7	-25.5
26	183	10.9	-4.8	-20	58.2	-11.1	sr	0.6	198	50.8	62.6	5.4	-14	57.4	6.4	2.5	sr	-4.0	212	7.9	-12.2	-11	30.2	-25.3
27	183	6.1	-5.0	-21	9.3	-10.7	sr	0.4	199	53.4	52.4	5.1	-14	51.0	1.7	2.3	sr	-4.0	211	55.7	-12.5	-11	55.5	-24.9
28	183	1.1	-5.2	-21	20.0	-10.3	sr	0.2	200	45.8	42.9	4.8	-14	49.3	-2.5	2.1	sr	-4.0	211	43.3	-12.7	-12	20.4	-24.7
29	182	55.9	-5.3	-21	30.3	-9.8	sr	0.0	201	28.6	34.1	4.4	-14	51.8	-6.4	2.0	sr	-4.0	211	30.5	-13.0	-12	45.1	-24.4
Nov 30	182	50.6	-5.5	-21	40.1	-9.5	sr	-0.1	202	2.8	26.2	4.0	-14	58.2	-9.8	1.7	sr	-4.0	211	17.5	-13.3	-13	9.5	-24.1
Dec 1	182	45.1	-5.7	-21	49.6	-9.0	sr	-0.2	202	28.9	19.0	3.6	-15	8.0	-12.7	1.5	sr	-4.0	211	4.3	-13.5	-13	33.6	-23.8
2	182	39.4	-5.8	-21	58.6	-8.7	sr	-0.3	202	47.9	12.6	3.2	-15	20.7	-15.3	1.3	sr	-4.0	210	50.8	-13.8	-13	57.4	-23.5
3	182	33.6	-6.0	-22	7.3	-8.1	sr	-0.4	203	0.5	6.8	2.9	-15	36.0	-17.4	1.0	sr	-4.0	210	37.0	-14.1	-14	20.9	-23.1
4	182	27.6	-6.1	-22	15.4	-7.8	sr	-0.4	203	7.3	1.7	2.6	-15	53.4	-19.1	0.9	sr	-4.0	210	22.9	-14.4	-14	44.0	-22.8
5	182	21.5	-6.3	-22	23.2	-7.3	sr	-0.5	203	9.1	-2.8	2.3	-16	12.5	-20.5	0.7	sr	-4.0	210	8.5	-14.7	-15	6.8	-22.3
6	182	15.2	-6.4	-22	30.5	-6.9	sr	-0.5	203	6.3	-6.8	2.0	-16	33.0	-21.5	0.5	sr	-4.0	209	53.8	-15.0	-15	29.1	-22.1
7	182	8.8	-6.5	-22	37.4	-6.5	sr	-0.5	202	59.5	-10.4	1.8	-16	54.5	-22.4	0.5	sr	-4.0	209	38.9	-15.3	-15	51.2	-21.6
8	182	2.3	-6.7	-22	43.9	-6.0	sr	-0.5	202	49.1	-13.6	1.6	-17	16.9	-22.9	0.3	sr	-4.0	209	23.6	-15.5	-16	12.8	-21.2
9	181	55.6	-6.8	-22	49.9	-5.5	sr	-0.5	202	35.5	-16.4	1.4	-17	39.8	-23.3	0.2	sr	-4.0	209	8.1	-15.8	-16	34.0	-20.8
10	181	48.8	-6.9	-22	55.4	-5.1	sr	-0.5	202	19.1	-18.9	1.3	-18	3.1	-23.4	0.1	sr	-4.0	208	52.2	-16.1	-16	54.8	-20.3
11	181	42.0	-7.0	-23	0.5	-4.7	sr	-0.5	202	0.2	-21.2	1.1	-18	26.5	-23.4	0.0	sr	-4.0	208	36.1	-16.4	-17	15.1	-19.9
12	181	35.0	-7.1	-23	5.2	-4.1	sr	-0.5	201	39.0	-23.2	1.0	-18	49.9	-23.3	-0.1	sr	-4.0	208	19.6	-16.7	-17	35.0	-19.4
13	181	27.9	-7.2	-23	9.3	-3.8	sr	-0.5	201	15.7	-25.1	0.9	-19	13.2	-23.0	-0.1	sr	-4.0	208	2.9	-17.0	-17	54.4	-19.0
14	181	20.8	-7.2	-23	13.1	-3.2	sr	-0.5	200	50.6	-26.8	0.8	-19	36.2	-22.6	-0.2	sr	-4.0	207	45.9	-17.3	-18	13.4	-18.5
15	181	13.5	-7.3	-23	16.3	-2.8	sr	-0.5	200	23.9	-28.3	0.8	-19	58.8	-22.1	-0.2	sr	-4.0	207	28.5	-17.6	-18	31.9	-18.0
16	181	6.3	-7.3	-23	19.1	-2.4	sr	-0.5	199	55.6	-29.7	0.7	-20	20.9	-21.5	-0.3	sr	-4.0	207	10.9	-17.9	-18	49.9	-17.4
17	180	58.9	-7.4	-23	21.5	-1.8	sr	-0.5	199	25.9	-31.0	0.6	-20	42.4	-20.8	-0.3	sr	-4.0	206	53.0	-18.2	-19	7.3	-17.0
18	180	51.6	-7.4	-23	23.3	-1.4	sr	-0.5	198	54.9	-32.1	0.6	-21	3.2	-20.1	-0.4	sr	-4.0	206	34.8	-18.5	-19	24.3	-16.4
19	180	44.2	-7.4	-23	24.7	-0.9	sr	-0.5	198	22.8	-33.2	0.5	-21	23.3	-19.3	-0.4	sr	-4.0	206	16.4	-18.7	-19	40.7	-15.9
20	180	36.7	-7.4	-23	25.6	-0.5	sr	-0.5	197	49.6	-34.2	0.5	-21	42.6	-18.4	-0.4	sr	-4.0	205	57.6	-19.0	-19	56.6	-15.3
21	180	29.3	-7.5	-23	26.1	0.0	sr	-0.5	197	15.4	-35.2	0.5	-22	1.0	-17.5	-0.5	sr	-4.0	205	38.6	-19.3	-20	11.9	-14.7
22	180	21.8	-7.5	-23	26.1	0.5	sr	-0.5	196	40.2	-36.1	0.4	-22	18.5	-16.5	-0.5	sr	-4.0	205	19.3	-19.5	-20	26.6	-14.2
23	180	14.4	-7.4	-23	25.6	1.0	sr	-0.5	196	4.1	-36.9	0.4	-22	35.0	-15.6	-0.5	sr	-4.0	204	59.8	-19.8	-20	40.8	-13.6
24	180	6.9	-7.4	-23	24.6	1.4	sr	-0.5	195	27.2	-37.7	0.4	-22	50.6	-14.5	-0.5	sr	-3.9	204	40.0	-20.0	-20	54.4	-13.0
25	179	59.5	-7.4	-23	23.2	1.9	sr	-0.5	194	49.4	-38.5	0.4	-23	5.1	-13.5	-0.5	sr	-3.9	204	20.0	-20.3	-21	7.4	-12.3
26	179	52.1	-7.4	-23	21.3	2.3	sr	-0.5	194	11.0	-39.2	0.4	-23	18.6	-12.3	-0.6	sr	-3.9	203	59.7	-20.5	-21	19.7	-11.8
27	179	44.7	-7.3	-23	19.0	2.9	sr	-0.6	193	31.8	-39.8	0.3	-23	30.9	-11.2	-0.6	sr	-3.9	203	39.2	-20.7	-21	31.5	-11.1
28	179	37.4	-7.3	-23	16.1	3.3	sr	-0.6	192	52.0	-40.5	0.3	-23	42.1	-10.0	-0.6	sr	-3.9	203	18.4	-20.9	-21	42.6	-10.5
29	179	30.1	-7.2	-23	12.8	3.7	sr	-0.6	192	11.5	-41.1	0.3	-23	52.1	-8.9	-0.5	sr	-3.9	202	57.5	-21.2	-21	53.1	-9.9
30	179	22.9	-7.2	-23	9.1	4.3	sr	-0.6	191	30.5	-41.6	0.3	-24	1.0	-7.6	-0.7	sr	-3.9	202	36.3	-21.3	-22	3.0	-9.1
Dec 31	179	15.7	-7.2	-23	4.8	4.9	sr	-0.6	190	48.8	-41.6	0.3	-24	8.6	-6.3	-0.7	sr	-3.9	202	15.0	-21.3	-22	12.1	-8.3

2012 Sun and Planets

Date	Mars								Jupiter								Saturn							
	vis	mag	GHA °	'	d '	Dec °	'	d '	vis	mag	GHA °	'	d '	Dec °	'	d '	vis	mag	GHA °	'	d '	Dec °	'	d '
Nov 21	y	1.2	147	9.8	9.1	-24	31.8	1.0	y	-2.8	348	48.6	67.5	21	32.2	-0.9	y	1.3	206	26.0	52.5	-11	14.1	-2.2
22	y	1.2	147	18.9	9.1	-24	30.8	1.2	y	-2.8	349	56.0	67.5	21	31.3	-0.9	y	1.3	207	18.5	52.6	-11	16.3	-2.1
23	y	1.2	147	28.0	9.0	-24	29.6	1.5	y	-2.8	351	3.5	67.6	21	30.4	-1.0	y	1.3	208	11.1	52.6	-11	18.4	-2.2
24	y	1.2	147	37.0	9.0	-24	28.1	1.8	y	-2.8	352	11.1	67.6	21	29.4	-0.9	y	1.3	209	3.6	52.6	-11	20.6	-2.1
25	y	1.2	147	46.0	9.0	-24	26.3	2.1	y	-2.8	353	18.8	67.7	21	28.5	-0.9	y	1.3	209	56.3	52.6	-11	22.7	-2.1
26	y	1.2	147	54.9	8.9	-24	24.2	2.3	y	-2.8	354	26.5	67.7	21	27.6	-1.0	y	1.3	210	48.9	52.7	-11	24.8	-2.1
27	y	1.2	148	3.8	8.9	-24	21.9	2.6	y	-2.8	355	34.2	67.8	21	26.6	-0.9	y	1.3	211	41.6	52.7	-11	26.9	-2.1
28	y	1.2	148	12.7	8.9	-24	19.3	2.9	y	-2.8	356	42.0	67.8	21	25.7	-1.0	y	1.3	212	34.3	52.7	-11	29.0	-2.1
29	y	1.2	148	21.6	8.9	-24	16.4	3.2	y	-2.8	357	49.8	67.8	21	24.7	-1.0	y	1.3	213	27.0	52.8	-11	31.1	-2.0
Nov 30	y	1.2	148	30.5	8.9	-24	13.2	3.4	y	-2.8	358	57.6	67.8	21	23.7	-0.9	y	1.3	214	19.8	52.8	-11	33.1	-2.1
Dec 1	y	1.2	148	39.3	8.9	-24	9.8	3.7	y	-2.8	0	5.4	67.9	21	22.8	-1.0	y	1.3	215	12.6	52.9	-11	35.2	-2.0
2	y	1.2	148	48.2	8.9	-24	6.1	4.0	y	-2.8	1	13.3	67.9	21	21.8	-1.0	y	1.3	216	5.5	52.9	-11	37.2	-1.9
3	y	1.2	148	57.1	8.9	-24	2.1	4.3	y	-2.8	2	21.2	67.9	21	20.8	-1.0	y	1.3	216	58.4	52.9	-11	39.1	-2.0
4	y	1.2	149	5.9	8.9	-23	57.8	4.5	y	-2.8	3	29.0	67.9	21	19.8	-1.0	y	1.3	217	51.3	53.0	-11	41.1	-2.0
5	y	1.2	149	14.8	8.9	-23	53.3	4.8	y	-2.8	4	36.9	67.8	21	18.8	-1.0	y	1.3	218	44.3	53.0	-11	43.1	-1.9
6	y	1.2	149	23.6	8.9	-23	48.5	5.0	y	-2.8	5	44.7	67.8	21	17.8	-1.0	y	1.3	219	37.3	53.1	-11	45.0	-1.9
7	y	1.2	149	32.5	8.9	-23	43.5	5.4	y	-2.8	6	52.5	67.8	21	16.8	-1.0	y	1.3	220	30.4	53.1	-11	46.9	-1.9
8	y	1.2	149	41.4	8.9	-23	38.1	5.6	y	-2.8	8	0.3	67.8	21	15.8	-1.0	y	1.4	221	23.5	53.2	-11	48.8	-1.8
9	y	1.2	149	50.3	8.9	-23	32.5	5.9	y	-2.8	9	8.1	67.7	21	14.8	-1.0	y	1.4	222	16.6	53.2	-11	50.6	-1.9
10	y	1.2	149	59.3	9.0	-23	26.6	6.1	y	-2.8	10	15.8	67.7	21	13.8	-1.0	y	1.4	223	9.8	53.2	-11	52.5	-1.8
11	y	1.2	150	8.3	9.0	-23	20.5	6.4	y	-2.8	11	23.4	67.6	21	12.8	-1.0	y	1.4	224	3.1	53.3	-11	54.3	-1.8
12	y	1.2	150	17.3	9.0	-23	14.1	6.7	y	-2.8	12	31.0	67.5	21	11.8	-1.0	y	1.4	224	56.4	53.3	-11	56.1	-1.8
13	y	1.2	150	26.3	9.1	-23	7.4	7.0	y	-2.8	13	38.6	67.5	21	10.8	-0.9	y	1.4	225	49.7	53.4	-11	57.9	-1.7
14	y	1.2	150	35.4	9.1	-23	0.4	7.2	y	-2.8	14	46.1	67.4	21	9.9	-1.0	y	1.4	226	43.1	53.5	-11	59.6	-1.8
15	y	1.2	150	44.5	9.2	-22	53.2	7.4	y	-2.8	15	53.4	67.3	21	8.9	-1.0	y	1.4	227	36.6	53.5	-12	1.4	-1.7
16	y	1.2	150	53.7	9.2	-22	45.8	7.7	y	-2.8	17	0.8	67.2	21	7.9	-0.9	y	1.4	228	30.1	53.6	-12	3.1	-1.6
17	y	1.2	151	2.9	9.3	-22	38.1	8.0	y	-2.8	18	8.0	67.1	21	7.0	-1.0	y	1.4	229	23.6	53.6	-12	4.7	-1.7
18	y	1.2	151	12.2	9.3	-22	30.1	8.3	y	-2.8	19	15.1	67.0	21	6.0	-0.9	y	1.4	230	17.3	53.7	-12	6.4	-1.6
19	y	1.2	151	21.5	9.4	-22	21.8	8.4	y	-2.8	20	22.1	66.9	21	5.1	-0.9	y	1.4	231	10.9	53.7	-12	8.0	-1.6
20	y	1.2	151	30.9	9.5	-22	13.4	8.8	y	-2.8	21	29.1	66.8	21	4.2	-1.0	y	1.4	232	4.7	53.8	-12	9.6	-1.6
21	y	1.2	151	40.4	9.5	-22	4.6	9.0	y	-2.8	22	35.9	66.7	21	3.2	-0.9	y	1.4	232	58.5	53.9	-12	11.2	-1.6
22	y	1.2	151	50.0	9.6	-21	55.6	9.2	y	-2.8	23	42.5	66.6	21	2.3	-0.8	y	1.4	233	52.3	53.9	-12	12.8	-1.5
23	y	1.2	151	59.6	9.7	-21	46.4	9.5	y	-2.8	24	49.1	66.4	21	1.5	-0.9	y	1.4	234	46.3	54.0	-12	14.3	-1.5
24	y	1.2	152	9.3	9.8	-21	36.9	9.7	y	-2.8	25	55.5	66.3	21	0.6	-0.9	y	1.4	235	40.2	54.0	-12	15.8	-1.5
25	y	1.2	152	19.1	9.9	-21	27.2	10.0	y	-2.8	27	1.9	66.2	20	59.7	-0.8	y	1.4	236	34.3	54.1	-12	17.3	-1.5
26	y	1.2	152	28.9	9.9	-21	17.2	10.2	y	-2.8	28	8.0	66.0	20	58.9	-0.8	y	1.4	237	28.4	54.2	-12	18.8	-1.4
27	y	1.2	152	38.9	10.0	-21	7.0	10.4	y	-2.8	29	14.0	65.9	20	58.1	-0.8	y	1.4	238	22.6	54.2	-12	20.2	-1.4
28	y	1.2	152	48.9	10.1	-20	56.6	10.7	y	-2.8	30	19.9	65.7	20	57.3	-0.8	y	1.4	239	16.8	54.3	-12	21.6	-1.4
29	y	1.2	152	59.0	10.2	-20	45.9	10.9	y	-2.7	31	25.6	65.6	20	56.5	-0.7	y	1.4	240	11.1	54.4	-12	23.0	-1.3
30	y	1.2	153	9.2	10.3	-20	35.0	11.1	y	-2.7	32	31.2	65.4	20	55.8	-0.8	y	1.4	241	5.5	54.5	-12	24.3	-1.3
Dec 31	y	1.2	153	19.5	10.3	-20	23.9	11.3	y	-2.7	33	36.6	65.4	20	55.0	-0.9	y	1.4	241	60.0	54.5	-12	25.6	-1.3