2011 Moon

h m	1 Jan GHA	1 Jan Dec			2 Jan GHA	2 Jan Dec			3 Jan GHA	3 Jan Dec			4 Jan GHA	4 Jan Dec			5 Jan GHA	5 Jan Dec			6 Jan GHA	6 Jan Dec		
	° ′	° ′	d	′	° ′	° ′	d	′	° ′	° ′	d	′	° ′	° ′	d	′	° ′	° ′	d	′	° ′	° ′	d	′
0 0	223 57.7	-22 50.4			210 21.1	-24 7.1			196 49.5	-24 0.7			183 42.3	-22 35.4			171 13.8	-20 1.8			159 30.0	-16 34.0		
20	228 46.4	-22 52.0	288.7	-1.6	215 9.7	-24 7.6	288.6	-0.5	201 38.4	-24 0.0	288.9	0.7	188 31.6	-22 33.7	289.3	1.7	176 3.7	-19 59.2	289.9	2.6	164 20.5	-16 30.8	290.5	3.2
40	233 35.1	-22 53.6			219 58.4	-24 8.1			206 27.2	-23 59.4			193 20.9	-22 32.0			180 53.6	-19 56.7			169 11.0	-16 27.6		
1 0	238 23.8	-22 55.2			224 47.0	-24 8.5			211 16.1	-23 58.7			198 10.3	-22 30.3			185 43.6	-19 54.1			174 1.6	-16 24.3		
20	243 12.5	-22 56.8	288.7	-1.6	229 35.7	-24 8.9	288.7	-0.4	216 5.0	-23 58.0	288.9	0.7	202 59.6	-22 28.5	289.3	1.8	190 33.5	-19 51.5	290.0	2.6	178 52.2	-16 21.1	290.6	3.2
40	248 1.2	-22 58.4			234 24.3	-24 9.4			220 53.9	-23 57.2			207 49.0	-22 26.8			195 23.4	-19 48.9			183 42.7	-16 17.9		
2 0	252 49.9	-22 59.9			239 13.0	-24 9.8			225 42.7	-23 56.5			212 38.3	-22 25.0			200 13.4	-19 46.3			188 33.3	-16 14.7		
20	257 38.6	-23 1.5	288.7	-1.5	244 1.6	-24 10.1	288.7	-0.4	230 31.6	-23 55.7	288.9	0.8	217 27.7	-22 23.2	289.4	1.8	205 3.4	-19 43.7	290.0	2.6	193 23.9	-16 11.4	290.6	3.3
40	262 27.3	-23 3.0			248 50.3	-24 10.5			235 20.5	-23 55.0			222 17.0	-22 21.5			209 53.3	-19 41.1			198 14.5	-16 8.2		
3 0	267 16.0	-23 4.5			253 39.0	-24 10.9			240 9.4	-23 54.2			227 6.4	-22 19.7			214 43.3	-19 38.4			203 5.1	-16 4.9		
20	272 4.7	-23 6.0	288.7	-1.5	258 27.6	-24 11.2	288.7	-0.3	244 58.3	-23 53.4	288.9	0.8	231 55.8	-22 17.8	289.4	1.8	219 33.3	-19 35.8	290.0	2.6	207 55.7	-16 1.7	290.6	3.3
40	276 53.4	-23 7.4			263 16.3	-24 11.5			249 47.2	-23 52.6			236 45.2	-22 16.0			224 23.3	-19 33.2			212 46.3	-15 58.4		
4 0	281 42.1	-23 8.9			268 4.9	-24 11.8			254 36.2	-23 51.7			241 34.6	-22 14.2			229 13.3	-19 30.5			217 37.0	-15 55.1		
20	286 30.7	-23 10.3	288.7	-1.4	272 53.6	-24 12.1	288.7	-0.3	259 25.1	-23 50.9	288.9	0.8	246 24.0	-22 12.3	289.4	1.9	234 3.4	-19 27.8	290.0	2.7	222 27.6	-15 51.8	290.6	3.3
40	291 19.4	-23 11.8			277 42.3	-24 12.4			264 14.0	-23 50.0			251 13.4	-22 10.5			238 53.4	-19 25.1			227 18.2	-15 48.5		
5 0	296 8.1	-23 13.2			282 30.9	-24 12.6			269 2.9	-23 49.2			256 2.8	-22 8.6			243 43.4	-19 22.4			232 8.9	-15 45.2		
20	300 56.8	-23 14.6	288.7	-1.4	287 19.6	-24 12.9	288.7	-0.2	273 51.9	-23 48.3	288.9	0.9	260 52.3	-22 6.7	289.4	1.9	248 33.5	-19 19.7	290.1	2.7	236 59.6	-15 41.9	290.7	3.3
40	305 45.5	-23 15.9			292 8.3	-24 13.1			278 40.8	-23 47.4			265 41.7	-22 4.8			253 23.5	-19 17.0			241 50.2	-15 38.6		
6 0	310 34.1	-23 17.3			296 56.9	-24 13.3			283 29.7	-23 46.4			270 31.2	-22 2.9			258 13.6	-19 14.3			246 40.9	-15 35.3		
20	315 22.8	-23 18.7	288.7	-1.3	301 45.6	-24 13.5	288.7	-0.2	288 18.7	-23 45.5	289.0	0.9	275 20.6	-22 0.9	289.5	2.0	263 3.7	-19 11.6	290.1	2.7	251 31.6	-15 32.0	290.7	3.3
40	320 11.5	-23 20.0			306 34.3	-24 13.6			293 7.7	-23 44.6			280 10.1	-21 59.0			267 53.7	-19 8.8			256 22.3	-15 28.6		
7 0	325 0.1	-23 21.3			311 23.0	-24 13.8			297 56.6	-23 43.6			284 59.6	-21 57.0			272 43.8	-19 6.1			261 13.0	-15 25.3		
20	329 48.8	-23 22.6	288.7	-1.3	316 11.6	-24 13.9	288.7	-0.1	302 45.6	-23 42.6	289.0	1.0	289 49.0	-21 55.1	289.5	2.0	277 33.9	-19 3.3	290.1	2.8	266 3.7	-15 21.9	290.7	3.4
40	334 37.5	-23 23.9			321 0.3	-24 14.1			307 34.6	-23 41.6			294 38.5	-21 53.1			282 24.0	-19 0.6			270 54.4	-15 18.6		
8 0	339 26.1	-23 25.2			325 49.0	-24 14.2			312 23.6	-23 40.6			299 28.0	-21 51.1			287 14.2	-18 57.8			275 45.1	-15 15.2		
20	344 14.8	-23 26.4	288.7	-1.2	330 37.7	-24 14.3	288.7	-0.1	317 12.5	-23 39.6	289.0	1.0	304 17.5	-21 49.1	289.5	2.0	292 4.3	-18 55.0	290.1	2.8	280 35.9	-15 11.9	290.7	3.4
40	349 3.5	-23 27.6			335 26.4	-24 14.3			322 1.5	-23 38.5			309 7.0	-21 47.1			296 54.4	-18 52.2			285 26.6	-15 8.5		
9 0	353 52.1	-23 28.9			340 15.1	-24 14.4			326 50.5	-23 37.5			313 56.6	-21 45.1			301 44.6	-18 49.4			290 17.4	-15 5.1		
20	358 40.8	-23 30.1	288.7	-1.2	345 3.8	-24 14.4	288.7	0.0	331 39.5	-23 36.4	289.0	1.1	318 46.1	-21 43.0	289.5	2.1	306 34.7	-18 46.6	290.2	2.8	295 8.1	-15 1.7	290.8	3.4
40	3 29.4	-23 31.3			349 52.5	-24 14.5			336 28.6	-23 35.3			323 35.6	-21 41.0			311 24.9	-18 43.7			299 58.9	-14 58.3		
10 0	8 18.1	-23 32.4			354 41.2	-24 14.5			341 17.6	-23 34.2			328 25.2	-21 38.9			316 15.0	-18 40.9			304 49.7	-14 54.9		
20	13 6.7	-23 33.6	288.7	-1.1	359 29.9	-24 14.5	288.7	0.0	346 6.6	-23 33.1	289.0	1.1	333 14.7	-21 36.8	289.6	2.1	321 5.2	-18 38.1	290.2	2.9	309 40.4	-14 51.5	290.8	3.4
40	17 55.4	-23 34.7			4 18.6	-24 14.5			350 55.6	-23 32.0			338 4.3	-21 34.8			325 55.4	-18 35.2			314 31.2	-14 48.1		
11 0	22 44.1	-23 35.8			9 7.3	-24 14.4			355 44.7	-23 30.9			342 53.9	-21 32.7			330 45.6	-18 32.3			319 22.0	-14 44.7		
20	27 32.7	-23 37.0	288.6	-1.1	13 56.0	-24 14.4	288.7	0.1	0 33.7	-23 29.7	289.0	1.2	347 43.4	-21 30.5	289.6	2.1	335 35.8	-18 29.5	290.2	2.9	324 12.8	-14 41.3	290.8	3.4
40	32 21.4	-23 38.0			18 44.7	-24 14.3			5 22.7	-23 28.5			352 33.0	-21 28.4			340 26.0	-18 26.6			329 3.7	-14 37.8		
12 0	37 10.0	-23 39.1			23 33.4	-24 14.2			10 11.8	-23 27.4			357 22.6	-21 26.3			345 16.2	-18 23.7			333 54.5	-14 34.4		
20	41 58.6	-23 40.2	288.6	-1.1	28 22.1	-24 14.1	288.7	0.1	15 0.9	-23 26.2	289.1	1.2	2 12.2	-21 24.1	289.6	2.2	350 6.5	-18 20.8	290.2	2.9	338 45.3	-14 30.9	290.8	3.5
40	46 47.3	-23 41.2			33 10.9	-24 14.0			19 49.9	-23 24.9			7 1.8	-21 22.0			354 56.7	-18 17.9			343 36.1	-14 27.5		
13 0	51 35.9	-23 42.3			37 59.6	-24 13.9			24 39.0	-23 23.7			11 51.5	-21 19.8			359 47.0	-18 15.0			348 27.0	-14 24.0		
20	56 24.6	-23 43.3	288.6	-1.0	42 48.3	-24 13.7	288.7	0.2	29 28.1	-23 22.5	289.1	1.2	16 41.1	-21 17.6	289.6	2.2	4 37.2	-18 12.0	290.3	2.9	353 17.8	-14 20.6	290.9	3.5
40	61 13.2	-23 44.3			47 37.0	-24 13.6			34 17.2	-23 21.2			21 30.7	-21 15.4			9 27.5	-18 9.1			358 8.7	-14 17.1		
14 0	66 1.9	-23 45.2			52 25.8	-24 13.4			39 6.3	-23 20.0			26 20.4	-21 13.2			14 17.8	-18 6.2			2 59.5	-14 13.6		
20	70 50.5	-23 46.2	288.6	-1.0	57 14.5	-24 13.2	288.7	0.2	43 55.4	-23 18.7	289.1	1.3	31 10.0	-21 11.0	289.7	2.2	19 8.0	-18 3.2	290.3	3.0	7 50.4	-14 10.2	290.9	3.5
40	75 39.2	-23 47.2			62 3.2	-24 13.0			48 44.5	-23 17.4			35 59.7	-21 8.8			23 58.3	-18 0.3			12 41.3	-14 6.7		
15 0	80 27.8	-23 48.1			66 52.0	-24 12.7			53 33.6	-23 16.1			40 49.4	-21 6.5			28 48.6	-17 57.3			17 32.2	-14 3.2		
20	85 16.4	-23 49.0	288.6	-0.9	71 40.7	-24 12.5	288.8	0.2	58 22.7	-23 14.7	289.1	1.4	45 39.1	-21 4.3	289.7	2.3	33 38.9	-17 54.3	290.3	3.0	22 23.1	-13 59.7	290.9	3.5
40	90 5.1	-23 49.9			76 29.5	-24 12.2			63 11.8	-23 13.4			50 28.7	-21 2.0			38 29.3	-17 51.3			27 14.0	-13 56.2		
16 0	94 53.7	-23 50.8			81 18.2	-24 12.0			68 1.0	-23 12.0			55 18.4	-20 59.7			43 19.6	-17 48.3			32 4.9	-13 52.7		
20	99 42.4	-23 51.6	288.6	-0.8	86 7.0	-24 11.7	288.8	0.3	72 50.1	-23 10.7	289.1	1.4	60 8.1	-20 57.4	289.7	2.3	48 9.9	-17 45.3	290.3	3.0	36 55.8	-13 49.1	290.9	3.5
40	104 31.0	-23 52.5			90 55.8	-24 11.4			77 39.3	-23 9.3			64 57.9	-20 55.1			53 0.3	-17 42.3			41 46.7	-13 45.6		
17 0	109 19.6	-23 53.3			95 44.5	-24 11.1			82 28.4	-23 7.9			69 47.6	-20 52.8			57 50.6	-17 39.3			46 37.7	-13 42.1		
20	114 8.3	-23 54.2	288.6	-0.8	100 33.3	-24 10.7	288.8	0.4	87 17.6	-23 6.5	289.2	1.4	74 37.3	-20 50.5	289.7	2.3	62 41.0	-17 36.3	290.4	3.0	51 28.6	-13 38.6	290.9	3.5
40	118 56.9	-23 55.0			105 22.1	-24 10.4			92 6.7	-23 5.1			79 27.1	-20 48.2			67 31.3	-17 33.2			56 19.6	-13 35.0		
18 0	123 45.5	-23 55.7			110 10.8	-24 10.0			96 55.9	-23 3.6			84 16.8	-20 45.8			72 21.7	-17 30.2			61 10.5	-13 31.5		
20	128 34.2	-23 56.5	288.6	-0.8	114 59.6	-24 9.6	288.8	0.4	101 45.1	-23 2.2	289.2	1.5	89 6.6	-20 43.5	289.8	2.4	77 12.1	-17 27.1	290.4	3.1	66 1.5	-13 27.9	291.0	3.6
40	133 22.8	-23 57.3			119 48.4	-24 9.2			106 34.3	-23 0.7			93 56.3	-20 41.1			82 2.5	-17 24.1			70 52.5	-13 24.4		
19 0	138 11.5	-23 58.0			124 37.2	-24 8.8			111 23.5	-22 59.2			98 46.1	-20 38.7			86 52.9	-17 21.0			75 43.4	-13 20.8		
20	143 0.1	-23 58.7	288.6	-0.7	129 26.0	-24 8.4	288.8	0.4	116 12.7	-22 57.7	289.2	1.5	103 35.9	-20 36.3	289.8	2.4	91 43.3	-17 17.9	290.4	3.1	80 34.4	-13 17.3	291.0	3.6
40	147 48.7	-23 59.4			134 14.8	-24 7.9			121 1.9	-22 56.2			108 25.7	-20 33.9			96 33.7	-17 14.8			85 25.4	-13 13.7		
20 0	152 37.4	-24 0.1			139 3.6	-24 7.5			125 51.1	-22 54.7			113 15.5	-20 31.5			101 24.2	-17 11.7			90 16.4	-13 10.1		
20	157 26.0	-24 0.8	288.6	-0.7	143 52.4	-24 7.0	288.8	0.5	130 40.3	-22 53.2	289.2	1.6	118 5.3	-20 29.1	289.8	2.4	106 14.6	-17 8.6	290.4	3.1	95 7.4	-13 6.5	291.0	3.6
40	162 14.7	-24 1.4			148 41.2	-24 6.5			135 29.6	-22 51.6			122 55.1	-20 26.7			111 5.0	-17 5.5			99 58.4	-13 2.9		
21 0	167 3.3	-24 2.1			153 30.0	-24 6.0			140 18.8	-22 50.0			127 44.9	-20 24.2			115 55.5	-17 2.4			104 49.4	-12 59.3		
20	171 51.9	-24 2.7	288.6	-0.6	158 18.8	-24 5.4	288.8	0.5	145 8.1	-22 48.5	289.3	1.6	132 34.8	-20 21.8	289.8	2.5	120 46.0	-16 59.3	290.5	3.1	109 40.5	-12 55.7	291.0	3.6
40	176 40.6	-24 3.3			163 7.6	-24 4.9			149 57.3	-22 46.9			137 24.6	-20 19.3			125 36.4	-16 56.1			114 31.5	-12 52.1		
22 0	181 29.2	-24 3.9			167 56.5	-24 4.4			154 46.6	-22 45.3			142 14.5	-20 16.8			130 26.9	-16 53.0			119 22.5	-12 48.5		
20	186 17.9	-24 4.5	288.6	-0.6	172 45.3	-24 3.8	288.8	0.6	159 35.9	-22 43.7	289.3	1.6	147 4.3	-20 14.4	289.9	2.5	135 17.4	-16 49.8	290.5	3.2	124 13.6	-12 44.9	291.1	3.6
40	191 6.5	-24 5.1			177 34.1	-24 3.2			164 25.1	-22 42.0			151 54.2	-20 11.9			140 7.9	-16 46.7			129 4.6	-12 41.3		
23 0	195 55.2	-24 5.6			182 23.0	-24 2.6			169 14.4	-22 40.4			156 44.1	-20 9.4			144 58.4	-16 43.5			133 55.7	-12 37.7		
20	200 43.8	-24 6.1	288.6	-0.5	187 11.8	-24 2.0	288.8	0.6	174 3.7	-22 38.7	289.3	1.7	161 34.0	-20 6.8	289.9	2.5	149 48.9	-16 40.3	290.5	3.2	138 46.8	-12 34.0	291.1	3.6
40	205 32.4	-24 6.6			192 0.7	-24 1.3			178 53.0	-22 37.1			166 23.9	-20 4.3			154 39.4	-16 37.1			143 37.8	-12 30.4		

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h m	7 Jan GHA ° ′	d	Dec ° ′	d ′	8 Jan GHA ° ′	d	Dec ° ′	d ′	9 Jan GHA ° ′	d	Dec ° ′	d ′	10 Jan GHA ° ′	d	Dec ° ′	d ′	11 Jan GHA ° ′	d	Dec ° ′	d ′	12 Jan GHA ° ′	d	Dec ° ′	d ′
0 0	148 28.9	291.1	-12 26.8	3.7	138 3.1	291.5	-7 53.8	3.9	128 1.6	291.8	-3 6.9	4.1	118 12.0	291.8	1 44.2	4.0	108 21.1	291.7	6 30.7	3.9	98 15.7	291.4	11 4.0	3.7
20	153 20.0		-12 23.1		142 54.6		-7 49.9		132 53.4		-3 2.8		123 3.8		1 48.3		113 12.9		6 34.6		103 7.2		11 7.7	
40	158 11.1		-12 19.5		147 46.1		-7 46.0		137 45.1		-2 58.8		127 55.7		1 52.3		118 4.6		6 38.5		107 58.6		11 11.3	
1 0	163 2.2	291.1	-12 15.8	3.7	152 37.6	291.5	-7 42.1	3.9	142 36.9	291.8	-2 54.7	4.0	132 47.5	291.8	1 56.3	4.0	122 56.3	291.7	6 42.4	3.9	112 50.0	291.4	11 15.0	3.6
20	167 53.3		-12 12.2		157 29.2		-7 38.2		147 28.7		-2 50.7		137 39.3		2 0.4		127 48.0		6 46.3		117 41.4		11 18.6	
40	172 44.4		-12 8.5		162 20.7		-7 34.2		152 20.4		-2 46.7		142 31.2		2 4.4		132 39.7		6 50.2		122 32.8		11 22.3	
2 0	177 35.6	291.1	-12 4.8	3.7	167 12.2	291.5	-7 30.3	3.9	157 12.2	291.8	-2 42.6	4.0	147 23.0	291.8	2 8.4	4.0	137 31.4	291.7	6 54.1	3.9	127 24.2	291.4	11 25.9	3.6
20	182 26.7		-12 1.2		172 3.8		-7 26.4		162 4.0		-2 38.6		152 14.8		2 12.4		142 23.1		6 58.0		132 15.6		11 29.6	
40	187 17.8		-11 57.5		176 55.3		-7 22.4		166 55.8		-2 34.5		157 6.7		2 16.5		147 14.8		7 1.9		137 7.0		11 33.2	
3 0	192 9.0	291.2	-11 53.8	3.7	181 46.8	291.6	-7 18.5	3.9	171 47.5	291.8	-2 30.5	4.0	161 58.5	291.8	2 20.5	4.0	152 6.5	291.7	7 5.8	3.9	141 58.4	291.4	11 36.8	3.6
20	197 0.1		-11 50.1		186 38.4		-7 14.6		176 39.3		-2 26.5		166 50.3		2 24.5		156 58.2		7 9.6		146 49.8		11 40.4	
40	201 51.3		-11 46.4		191 29.9		-7 10.6		181 31.1		-2 22.4		171 42.2		2 28.5		161 49.9		7 13.5		151 41.1		11 44.1	
4 0	206 42.4	291.2	-11 42.7	3.7	196 21.5	291.6	-7 6.7	3.9	186 22.9	291.8	-2 18.4	4.1	176 34.0	291.8	2 32.5	4.0	166 41.6	291.7	7 17.4	3.9	156 32.5	291.4	11 47.7	3.6
20	211 33.6		-11 39.0		201 13.1		-7 2.7		191 14.7		-2 14.3		181 25.8		2 36.6		171 33.3		7 21.3		161 23.9		11 51.3	
40	216 24.8		-11 35.3		206 4.6		-6 58.8		196 6.4		-2 10.3		186 17.6		2 40.6		176 25.0		7 25.1		166 15.2		11 54.9	
5 0	221 16.0	291.2	-11 31.6	3.7	210 56.2	291.6	-6 54.9	4.0	200 58.2	291.8	-2 6.2	4.0	191 9.5	291.8	2 44.6	4.0	181 16.7	291.7	7 29.0	3.9	171 6.6	291.3	11 58.5	3.6
20	226 7.2		-11 27.9		215 47.8		-6 50.9		205 50.0		-2 2.2		196 1.3		2 48.6		186 8.3		7 32.9		175 57.9		12 2.1	
40	230 58.4		-11 24.2		220 39.3		-6 46.9		210 41.8		-1 58.2		200 53.1		2 52.6		191 0.0		7 36.7		180 49.2		12 5.7	
6 0	235 49.6	291.2	-11 20.5	3.7	225 30.9	291.6	-6 43.0	4.0	215 33.6	291.8	-1 54.1	4.0	205 44.9	291.8	2 56.6	4.0	195 51.7	291.7	7 40.6	3.9	185 40.6	291.3	12 9.2	3.6
20	240 40.8		-11 16.7		230 22.5		-6 39.0		220 25.4		-1 50.1		210 36.8		3 0.6		200 43.3		7 44.5		190 31.9		12 12.8	
40	245 32.0		-11 13.0		235 14.1		-6 35.1		225 17.2		-1 46.0		215 28.6		3 4.6		205 35.0		7 48.3		195 23.2		12 16.4	
7 0	250 23.2	291.2	-11 9.3	3.8	240 5.7	291.6	-6 31.1	4.0	230 9.0	291.8	-1 42.0	4.1	220 20.4	291.8	3 8.6	4.0	210 26.7	291.7	7 52.2	3.8	200 14.5	291.3	12 20.0	3.5
20	255 14.4		-11 5.5		244 57.3		-6 27.1		235 0.8		-1 37.9		225 12.2		3 12.7		215 18.3		7 56.0		205 5.8		12 23.5	
40	260 5.7		-11 1.8		249 48.9		-6 23.2		239 52.6		-1 33.9		230 4.0		3 16.7		220 10.0		7 59.9		209 57.1		12 27.1	
8 0	264 56.9	291.3	-10 58.0	3.7	254 40.5	291.6	-6 19.2	4.0	244 44.4	291.8	-1 29.8	4.0	234 55.9	291.8	3 20.7	4.0	225 1.6	291.6	8 3.7	3.8	214 48.4	291.3	12 30.6	3.6
20	269 48.1		-10 54.3		259 32.1		-6 15.2		249 36.2		-1 25.8		239 47.7		3 24.7		229 53.3		8 7.5		219 39.7		12 34.2	
40	274 39.4		-10 50.5		264 23.7		-6 11.3		254 28.0		-1 21.7		244 39.5		3 28.7		234 44.9		8 11.4		224 31.0		12 37.7	
9 0	279 30.7	291.3	-10 46.8	3.8	269 15.3	291.6	-6 7.3	4.0	259 19.8	291.8	-1 17.7	4.1	249 31.3	291.8	3 32.7	4.0	239 36.5	291.6	8 15.2	3.8	229 22.3	291.3	12 41.3	3.5
20	284 21.9		-10 43.0		274 7.0		-6 3.3		264 11.6		-1 13.6		254 23.1		3 36.7		244 28.2		8 19.0		234 13.5		12 44.8	
40	289 13.2		-10 39.2		278 58.6		-5 59.3		269 3.4		-1 9.6		259 14.9		3 40.7		249 19.8		8 22.9		239 4.8		12 48.3	
10 0	294 4.5	291.3	-10 35.5	3.8	283 50.2	291.6	-5 55.4	4.0	273 55.3	291.8	-1 5.5	4.0	264 6.7	291.8	3 44.6	4.0	254 11.4	291.6	8 26.7	3.8	243 56.1	291.2	12 51.9	3.5
20	298 55.7		-10 31.7		288 41.9		-5 51.4		278 47.1		-1 1.5		268 58.5		3 48.6		259 3.0		8 30.5		248 47.3		12 55.4	
40	303 47.0		-10 27.9		293 33.5		-5 47.4		283 38.9		-0 57.5		273 50.4		3 52.6		263 54.7		8 34.3		253 38.6		12 58.9	
11 0	308 38.3	291.3	-10 24.1	3.8	298 25.1	291.6	-5 43.4	4.0	288 30.7	291.8	-0 53.4	4.0	278 42.2	291.8	3 56.6	4.0	268 46.3	291.6	8 38.1	3.8	258 29.8	291.2	13 2.4	3.5
20	313 29.6		-10 20.3		303 16.8		-5 39.4		293 22.5		-0 49.4		283 34.0		4 0.6		273 37.9		8 41.9		263 21.0		13 5.9	
40	318 20.9		-10 16.5		308 8.4		-5 35.4		298 14.3		-0 45.3		288 25.8		4 4.6		278 29.5		8 45.7		268 12.3		13 9.4	
12 0	323 12.2	291.3	-10 12.7	3.8	313 0.1	291.7	-5 31.4	4.0	303 6.1	291.8	-0 41.3	4.1	293 17.6	291.8	4 8.6	4.0	283 21.1	291.6	8 49.6	3.8	273 3.5	291.2	13 12.9	3.5
20	328 3.6		-10 8.9		317 51.7		-5 27.5		307 58.0		-0 37.2		298 9.4		4 12.6		288 12.7		8 53.4		277 54.7		13 16.4	
40	332 54.9		-10 5.1		322 43.4		-5 23.5		312 49.8		-0 33.2		303 1.2		4 16.5		293 4.3		8 57.1		282 45.9		13 19.9	
13 0	337 46.2	291.3	-10 1.3	3.8	327 35.1	291.7	-5 19.5	4.0	317 41.6	291.8	-0 29.1	4.0	307 53.0	291.8	4 20.5	4.0	297 55.9	291.6	9 0.9	3.8	287 37.1	291.2	13 23.4	3.5
20	342 37.5		-9 57.5		332 26.7		-5 15.5		322 33.4		-0 25.1		312 44.8		4 24.5		302 47.4		9 4.7		292 28.3		13 26.8	
40	347 28.9		-9 53.7		337 18.4		-5 11.5		327 25.2		-0 21.0		317 36.6		4 28.5		307 39.0		9 8.5		297 19.5		13 30.3	
14 0	352 20.2	291.4	-9 49.9	3.8	342 10.1	291.7	-5 7.5	4.0	332 17.1	291.8	-0 17.0	4.1	322 28.3	291.8	4 32.4	4.0	312 30.6	291.6	9 12.3	3.8	302 10.7	291.2	13 33.8	3.4
20	357 11.6		-9 46.1		347 1.7		-5 3.5		337 8.9		-0 12.9		327 20.1		4 36.4		317 22.2		9 16.1		307 1.8		13 37.2	
40	2 2.9		-9 42.2		351 53.4		-4 59.5		342 0.7		-0 8.9		332 11.9		4 40.4		322 13.7		9 19.9		311 53.0		13 40.7	
15 0	6 54.3	291.4	-9 38.4	3.8	356 45.1	291.7	-4 55.5	4.0	346 52.5	291.8	-0 4.8	4.0	337 3.7	291.8	4 44.4	4.0	327 5.3	291.6	9 23.6	3.8	316 44.2	291.1	13 44.1	3.4
20	11 45.7		-9 34.6		1 36.8		-4 51.4		351 44.4		-0 0.8		341 55.5		4 48.3		331 56.9		9 27.4		321 35.3		13 47.6	
40	16 37.0		-9 30.7		6 28.5		-4 47.4		356 36.2		0 3.3		346 47.3		4 52.3		336 48.4		9 31.2		326 26.5		13 51.0	
16 0	21 28.4	291.4	-9 26.9	3.8	11 20.2	291.7	-4 43.4	4.0	1 28.0	291.8	0 7.3	4.0	351 39.1	291.8	4 56.3	3.9	341 40.0	291.5	9 34.9	3.8	331 17.6	291.1	13 54.4	3.4
20	26 19.8		-9 23.1		16 11.9		-4 39.4		6 19.9		0 11.4		356 30.8		5 0.2		346 31.5		9 38.7		336 8.7		13 57.9	
40	31 11.2		-9 19.2		21 3.6		-4 35.4		11 11.7		0 15.4		1 22.6		5 4.2		351 23.1		9 42.4		340 59.9		14 1.3	
17 0	36 2.6	291.4	-9 15.4	3.9	25 55.3	291.7	-4 31.4	4.0	16 3.5	291.8	0 19.4	4.1	6 14.4	291.8	5 8.1	4.0	356 14.6	291.5	9 46.2	3.7	345 51.0	291.1	14 4.7	3.4
20	40 54.0		-9 11.5		30 47.0		-4 27.4		20 55.4		0 23.5		11 6.2		5 12.1		1 6.1		9 49.9		350 42.1		14 8.1	
40	45 45.4		-9 7.7		35 38.7		-4 23.4		25 47.2		0 27.5		15 57.9		5 16.0		5 57.6		9 53.7		355 33.2		14 11.5	
18 0	50 36.8	291.4	-9 3.8	3.9	40 30.4	291.7	-4 19.3	4.0	30 39.0	291.8	0 31.6	4.0	20 49.7	291.8	5 20.0	3.9	10 49.2	291.5	9 57.4	3.7	0 24.3	291.1	14 14.9	3.4
20	55 28.2		-8 59.9		45 22.1		-4 15.3		35 30.8		0 35.6		25 41.5		5 23.9		15 40.7		10 1.1		5 15.4		14 18.3	
40	60 19.7		-8 56.1		50 13.8		-4 11.3		40 22.7		0 39.7		30 33.2		5 27.9		20 32.2		10 4.9		10 6.5		14 21.7	
19 0	65 11.1	291.4	-8 52.2	3.9	55 5.5	291.7	-4 7.3	4.0	45 14.5	291.8	0 43.7	4.0	35 25.0	291.8	5 31.8	3.9	25 23.7	291.5	10 8.6	3.7	14 57.5	291.1	14 25.0	3.4
20	70 2.5		-8 48.3		59 57.2		-4 3.3		50 6.3		0 47.7		40 16.8		5 35.8		30 15.2		10 12.3		19 48.6		14 28.4	
40	74 54.0		-8 44.5		64 49.0		-3 59.2		54 58.2		0 51.8		45 8.5		5 39.7		35 6.7		10 16.0		24 39.7		14 31.8	
20 0	79 45.4	291.5	-8 40.6	3.9	69 40.7	291.7	-3 55.2	4.0	59 50.0	291.8	0 55.8	4.0	50 0.3	291.8	5 43.6	3.9	39 58.2	291.5	10 19.8	3.7	29 30.7	291.0	14 35.1	3.4
20	84 36.8		-8 36.7		74 32.4		-3 51.2		64 41.8		0 59.9		54 52.0		5 47.6		44 49.7		10 23.5		34 21.8		14 38.5	
40	89 28.3		-8 32.8		79 24.2		-3 47.2		69 33.7		1 3.9		59 43.8		5 51.5		49 41.2		10 27.2		39 12.8		14 41.8	
21 0	94 19.8	291.5	-8 28.9	3.9	84 15.9	291.7	-3 43.1	4.0	74 25.5	291.8	1 7.9	4.0	64 35.5	291.7	5 55.4	3.9	54 32.7	291.5	10 30.9	3.7	44 3.9	291.0	14 45.2	3.3
20	99 11.2		-8 25.1		89 7.6		-3 39.1		79 17.3		1 12.0		69 27.3		5 59.4		59 24.1		10 34.6		48 54.9		14 48.5	
40	104 2.7		-8 21.2		93 59.4		-3 35.1		84 9.2		1 16.0		74 19.0		6 3.3		64 15.6		10 38.3		53 45.9		14 51.8	
22 0	108 54.2	291.5	-8 17.3	3.9	98 51.1	291.7	-3 31.1	4.0	89 1.0	291.8	1 20.0	4.0	79 10.8	291.7	6 7.2	3.9	69 7.1	291.5	10 42.0	3.7	58 36.9	291.0	14 55.2	3.3
20	113 45.6		-8 13.4		103 42.9		-3 27.0		93 52.8		1 24.1		84 2.5		6 11.1		73 58.5		10 45.6		63 27.9		14 58.5	
40	118 37.1		-8 9.5		108 34.6		-3 23.0		98 44.7		1 28.1		88 54.2		6 15.1		78 50.0		10 49.3		68 18.9		15 1.8	
23 0	123 28.6	291.5	-8 5.6	3.9	113 26.4	291.8	-3 19.0	4.0	103 36.5	291.8	1 32.1	4.0	93 46.0	291.7	6 19.0	3.9	83 41.4	291.4	10 53.0	3.7	73 9.9	291.0	15 5.1	3.3
20	128 20.1		-8 1.7		118 18.1		-3 14.9		108 28.3		1 36.2		98 37.7		6 22.9		88 32.9		10 56.7		78 0.9		15 8.4	
40	133 11.6		-7 57.7		123 9.9		-3 10.9		113 20.2		1 40.2		103 29.4		6 26.8		93 24.3		11 0.4		82 51.9		15 11.7	

2011 Moon

	13 Jan					14 Jan					15 Jan					16 Jan					17 Jan					18 Jan				
	GHA			Dec		GHA			Dec		GHA			Dec		GHA			Dec		GHA			Dec		GHA			Dec	
h m	°	'	d	°	'	°	'	d	°	'	°	'	d	°	'	°	'	d	°	'	°	'	d	°	'	°	'	d	°	'
0 0	87	42.8	291.0	15	15.0	76	30.9	290.3	18	52.8	64	31.7	289.6	21	44.7	51	43.1	289.0	23	36.2	38	11.7	288.5	24	13.2	24	13.4	288.3	23	25.1
20	92	33.8		15	18.3	81	21.3		18	55.5	69	21.4		21	46.6	56	32.1		23	37.2	43	0.2		24	13.1	29	1.7		23	23.8
40	97	24.7		15	21.5	86	11.6		18	58.2	74	11.0		21	48.6	61	21.1		23	38.3	47	48.7		24	13.0	33	49.9		23	22.4
1 0	102	15.7	290.9	15	24.8	91	1.9	290.3	19	1.0	79	0.7	289.6	21	50.6	66	10.1	289.0	23	39.3	52	37.2	288.5	24	12.9	38	38.2	288.3	23	21.1
20	107	6.6		15	28.1	95	52.2		19	3.7	83	50.3		21	52.6	70	59.1		23	40.3	57	25.7		24	12.8	43	26.5		23	19.8
40	111	57.5		15	31.3	100	42.6		19	6.4	88	39.9		21	54.5	75	48.0		23	41.3	62	14.1		24	12.7	48	14.7		23	18.4
2 0	116	48.5	290.9	15	34.6	105	32.9	290.3	19	9.1	93	29.5	289.6	21	56.5	80	37.0	288.9	23	42.3	67	2.6	288.5	24	12.5	53	3.0	288.3	23	17.0
20	121	39.4		15	37.8	110	23.2		19	11.7	98	19.1		21	58.4	85	25.9		23	43.2	71	51.1		24	12.3	57	51.2		23	15.6
40	126	30.3		15	41.0	115	13.4		19	14.4	103	8.7		22	0.3	90	14.9		23	44.2	76	39.5		24	12.2	62	39.5		23	14.2
3 0	131	21.2	290.9	15	44.3	120	3.7	290.3	19	17.1	107	58.3	289.6	22	2.2	95	3.8	288.9	23	45.1	81	28.0	288.4	24	11.9	67	27.8	288.3	23	12.8
20	136	12.1		15	47.5	124	54.0		19	19.7	112	47.9		22	4.1	99	52.7		23	46.0	86	16.4		24	11.7	72	16.0		23	11.3
40	141	3.0		15	50.7	129	44.2		19	22.4	117	37.4		22	6.0	104	41.6		23	47.0	91	4.9		24	11.5	77	4.3		23	9.9
4 0	145	53.8	290.9	15	53.9	134	34.5	290.2	19	25.0	122	27.0	289.5	22	7.8	109	30.5	288.9	23	47.8	95	53.3	288.4	24	11.2	81	52.5	288.3	23	8.4
20	150	44.7		15	57.1	139	24.7		19	27.6	127	16.5		22	9.7	114	19.4		23	48.7	100	41.8		24	11.0	86	40.8		23	6.9
40	155	35.5		16	0.3	144	14.9		19	30.2	132	6.1		22	11.5	119	8.3		23	49.6	105	30.2		24	10.7	91	29.1		23	5.4
5 0	160	26.4	290.8	16	3.5	149	5.2	290.2	19	32.8	136	55.6	289.5	22	13.4	123	57.2	288.9	23	50.4	110	18.6	288.4	24	10.4	96	17.3	288.3	23	3.8
20	165	17.2		16	6.7	153	55.4		19	35.4	141	45.1		22	15.2	128	46.1		23	51.3	115	7.0		24	10.1	101	5.6		23	2.3
40	170	8.1		16	9.8	158	45.6		19	38.0	146	34.6		22	17.0	133	34.9		23	52.1	119	55.5		24	9.7	105	53.8		23	0.7
6 0	174	58.9	290.8	16	13.0	163	35.8	290.2	19	40.6	151	24.1	289.5	22	18.8	138	23.8	288.8	23	52.9	124	43.9	288.4	24	9.4	110	42.1	288.3	22	59.1
20	179	49.7		16	16.2	168	25.9		19	43.2	156	13.6		22	20.5	143	12.7		23	53.7	129	32.3		24	9.0	115	30.4		22	57.5
40	184	40.5		16	19.3	173	16.1		19	45.7	161	3.1		22	22.3	148	1.5		23	54.5	134	20.7		24	8.6	120	18.6		22	55.9
7 0	189	31.3	290.8	16	22.5	178	6.3	290.1	19	48.3	165	52.5	289.4	22	24.1	152	50.3	288.8	23	55.2	139	9.1	288.4	24	8.2	125	6.9	288.3	22	54.3
20	194	22.1		16	25.6	182	56.4		19	50.8	170	42.0		22	25.8	157	39.2		23	56.0	143	57.5		24	7.8	129	55.1		22	52.6
40	199	12.9		16	28.7	187	46.6		19	53.4	175	31.4		22	27.5	162	28.0		23	56.7	148	45.9		24	7.4	134	43.4		22	50.9
8 0	204	3.7	290.8	16	31.9	192	36.7	290.1	19	55.9	180	20.9	289.4	22	29.3	167	16.8	288.8	23	57.4	153	34.3	288.4	24	6.9	139	31.6	288.3	22	49.3
20	208	54.5		16	35.0	197	26.8		19	58.4	185	10.3		22	31.0	172	5.6		23	58.1	158	22.7		24	6.5	144	19.9		22	47.6
40	213	45.2		16	38.1	202	16.9		20	0.9	189	59.7		22	32.7	176	54.4		23	58.8	163	11.0		24	6.0	149	8.2		22	45.8
9 0	218	36.0	290.7	16	41.2	207	7.0	290.1	20	3.4	194	49.1	289.4	22	34.3	181	43.2	288.8	23	59.5	167	59.4	288.4	24	5.5	153	56.4	288.3	22	44.1
20	223	26.7		16	44.3	211	57.1		20	5.9	199	38.5		22	36.0	186	32.0		24	0.1	172	47.8		24	4.9	158	44.7		22	42.3
40	228	17.4		16	47.4	216	47.2		20	8.3	204	27.9		22	37.7	191	20.7		24	0.7	177	36.2		24	4.4	163	32.9		22	40.6
10 0	233	8.2	290.7	16	50.4	221	37.3	290.1	20	10.8	209	17.3	289.4	22	39.3	196	9.5	288.8	24	1.4	182	24.5	288.4	24	3.8	168	21.2	288.3	22	38.8
20	237	58.9		16	53.5	226	27.4		20	13.2	214	6.7		22	40.9	200	58.3		24	2.0	187	12.9		24	3.3	173	9.5		22	37.0
40	242	49.6		16	56.6	231	17.4		20	15.7	218	56.1		22	42.5	205	47.0		24	2.6	192	1.2		24	2.7	177	57.7		22	35.1
11 0	247	40.3	290.7	16	59.6	236	7.5	290.0	20	18.1	223	45.4	289.3	22	44.1	210	35.8	288.7	24	3.1	196	49.6	288.3	24	2.1	182	46.0	288.3	22	33.3
20	252	31.0		17	2.7	240	57.5		20	20.5	228	34.8		22	45.7	215	24.5		24	3.7	201	38.0		24	1.5	187	34.3		22	31.4
40	257	21.7		17	5.7	245	47.5		20	22.9	233	24.1		22	47.3	220	13.2		24	4.2	206	26.3		24	0.8	192	22.5		22	29.6
12 0	262	12.4	290.7	17	8.8	250	37.5	290.0	20	25.3	238	13.4	289.3	22	48.9	225	2.0	288.7	24	4.8	211	14.6	288.3	24	0.2	197	10.8	288.3	22	27.7
20	267	3.0		17	11.8	255	27.5		20	27.7	243	2.7		22	50.4	229	50.7		24	5.3	216	3.0		23	59.5	201	59.1		22	25.8
40	271	53.7		17	14.8	260	17.5		20	30.1	247	52.0		22	52.0	234	39.4		24	5.8	220	51.3		23	58.8	206	47.3		22	23.8
13 0	276	44.3	290.6	17	17.8	265	7.5	290.0	20	32.5	252	41.3	289.3	22	53.5	239	28.1	288.7	24	6.3	225	39.7	288.3	23	58.1	211	35.6	288.3	22	21.9
20	281	35.0		17	20.8	269	57.5		20	34.8	257	30.6		22	55.0	244	16.8		24	6.7	230	28.0		23	57.4	216	23.9		22	19.9
40	286	25.6		17	23.8	274	47.5		20	37.2	262	19.9		22	56.5	249	5.5		24	7.2	235	16.3		23	56.6	221	12.1		22	18.0
14 0	291	16.2	290.6	17	26.8	279	37.4	289.9	20	39.5	267	9.2	289.3	22	58.0	253	54.2	288.7	24	7.6	240	4.7	288.3	23	55.9	226	0.4	288.3	22	16.0
20	296	6.9		17	29.8	284	27.4		20	41.9	271	58.4		22	59.4	258	42.8		24	8.0	244	53.0		23	55.1	230	48.7		22	14.0
40	300	57.5		17	32.8	289	17.3		20	44.2	276	47.7		23	0.9	263	31.5		24	8.4	249	41.3		23	54.3	235	37.0		22	11.9
15 0	305	48.1	290.6	17	35.8	294	7.3	289.9	20	46.5	281	36.9	289.2	23	2.4	268	20.2	288.6	24	8.8	254	29.6	288.3	23	53.5	240	25.2	288.3	22	9.9
20	310	38.7		17	38.7	298	57.2		20	48.8	286	26.2		23	3.8	273	8.8		24	9.2	259	17.9		23	52.6	245	13.5		22	7.8
40	315	29.2		17	41.7	303	47.1		20	51.1	291	15.4		23	5.2	277	57.5		24	9.5	264	6.2		23	51.8	250	1.8		22	5.8
16 0	320	19.8	290.6	17	44.6	308	37.0	289.9	20	53.3	296	4.6	289.2	23	6.6	282	46.1	288.6	24	9.9	268	54.6	288.3	23	50.9	254	50.1	288.3	22	3.7
20	325	10.4		17	47.6	313	26.9		20	55.6	300	53.8		23	8.0	287	34.8		24	10.2	273	42.9		23	50.1	259	38.4		22	1.6
40	330	0.9		17	50.5	318	16.8		20	57.9	305	43.0		23	9.4	292	23.4		24	10.5	278	31.2		23	49.2	264	26.6		21	59.4
17 0	334	51.5	290.5	17	53.4	323	6.6	289.9	21	0.1	310	32.2	289.2	23	10.7	297	12.0	288.6	24	10.8	283	19.5	288.3	23	48.2	269	14.9	288.3	21	57.3
20	339	42.0		17	56.3	327	56.5		21	2.3	315	21.4		23	12.1	302	0.6		24	11.1	288	7.8		23	47.3	274	3.2		21	55.1
40	344	32.6		17	59.2	332	46.4		21	4.6	320	10.5		23	13.4	306	49.2		24	11.3	292	56.1		23	46.4	278	51.5		21	52.9
18 0	349	23.1	290.5	18	2.1	337	36.2	289.8	21	6.8	324	59.7	289.1	23	14.7	311	37.9	288.6	24	11.6	297	44.4	288.3	23	45.4	283	39.8	288.3	21	50.8
20	354	13.6		18	5.0	342	26.0		21	9.0	329	48.9		23	16.1	316	26.4		24	11.8	302	32.7		23	44.4	288	28.1		21	48.5
40	359	4.1		18	7.9	347	15.9		21	11.2	334	38.0		23	17.3	321	15.0		24	12.0	307	21.0		23	43.4	293	16.4		21	46.3
19 0	3	54.6	290.5	18	10.7	352	5.7	289.8	21	13.3	339	27.1	289.1	23	18.6	326	3.6	288.6	24	12.2	312	9.3	288.3	23	42.4	298	4.7	288.3	21	44.1
20	8	45.1		18	13.6	356	55.5		21	15.5	344	16.3		23	19.9	330	52.2		24	12.4	316	57.5		23	41.4	302	53.0		21	41.8
40	13	35.5		18	16.5	1	45.3		21	17.7	349	5.4		23	21.1	335	40.8		24	12.5	321	45.8		23	40.3	307	41.3		21	39.5
20 0	18	26.0	290.4	18	19.3	6	35.1	289.8	21	19.8	353	54.5	289.1	23	22.4	340	29.4	288.6	24	12.7	326	34.1	288.3	23	39.2	312	29.6	288.3	21	37.2
20	23	16.5		18	22.1	11	24.8		21	21.9	358	43.6		23	23.6	345	17.9		24	12.8	331	22.4		23	38.1	317	17.9		21	34.9
40	28	6.9		18	25.0	16	14.6		21	24.1	3	32.7		23	24.8	350	6.5		24	12.9	336	10.7		23	37.0	322	6.2		21	32.6
21 0	32	57.4	290.4	18	27.8	21	4.4	289.7	21	26.2	8	21.8	289.1	23	26.0	354	55.0	288.5	24	13.0	340	59.0	288.3	23	35.9	326	54.5	288.3	21	30.3
20	37	47.8		18	30.6	25	54.1		21	28.3	13	10.8		23	27.2	359	43.6		24	13.1	345	47.2		23	34.8	331	42.9		21	27.9
40	42	38.2		18	33.4	30	43.8		21	30.4	17	59.9		23	28.4	4	32.1		24	13.2	350	35.5		23	33.6	336	31.2		21	25.5
22 0	47	28.6	290.4	18	36.2	35	33.6	289.7	21	32.4	22	49.0	289.0	23	29.5	9	20.6	288.5	24	13.2	355	23.8	288.3	23	32.5	341	19.5	288.3	21	23.2
20	52	19.0		18	39.0	40	23.3		21	34.5	27	38.0		23	30.7	14	9.2		24	13.2	0	12.1		23	31.3	346	7.8		21	20.8
40	57	9.4		18	41.8	45	13.0		21	36.6	32	27.0		23	31.8	18	57.7		24	13.3	5	0.3		23	30.1	350	56.1		21	18.3
23 0	61	59.8	290.4	18	44.5	50	2.7	289.7	21	38.6	37	16.1	289.0	23	32.9	23	46.2	288.5	24	13.3	9	48.6	288.3	23	28.8	355	44.5	288.3	21	15.9
20	66	50.2		18	47.3	54	52.4		21	40.6	42	5.1		23	34.0	28	34.7		24	13.2	14	36.9		23	27.6	0	32.8		21	13.4
40	71	40.5		18	50.0	59	42.1		21	42.6	46	54.1		23	35.1	33	23.2		24	13.2	19	25.1		23	26.3	5	21.1		21	11.0

2011 Moon

h m	19 Jan GHA ° ′	d	Dec ° ′	d′	20 Jan GHA ° ′	d	Dec ° ′	d′	21 Jan GHA ° ′	d	Dec ° ′	d′	22 Jan GHA ° ′	d	Dec ° ′	d′	23 Jan GHA ° ′	d	Dec ° ′	d′	24 Jan GHA ° ′	d	Dec ° ′	d′
0 0	10 9.5	288.3	21 8.5	-2.5	356 19.6	288.6	17 29.4	-3.6	342 55.7	289.0	12 42.7	-4.4	329 59.7	289.4	7 9.0	-4.9	317 25.5	289.6	1 11.5	-5.0	305 2.2	289.7	-4 46.5	-4.9
20	14 57.8		21 6.0		1 8.3		17 25.9		347 44.8		12 38.3		334 49.1		7 4.1		322 15.1		1 6.5		309 51.8		-4 51.4	
40	19 46.2		21 3.5		5 56.9		17 22.3		352 33.8		12 33.9		339 38.5		6 59.2		327 4.8		1 1.5		314 41.5		-4 56.3	
1 0	24 34.5	288.4	21 0.9	-2.6	10 45.6	288.7	17 18.7	-3.6	357 22.9	289.1	12 29.6	-4.4	344 27.9	289.4	6 54.4	-4.9	331 54.4	289.6	0 56.5	-5.0	319 31.2	289.7	-5 1.2	-4.8
20	29 22.8		20 58.4		15 34.2		17 15.1		2 11.9		12 25.2		349 17.4		6 49.5		336 44.0		0 51.4		324 20.9		-5 6.0	
40	34 11.2		20 55.8		20 22.9		17 11.5		7 1.0		12 20.8		354 6.8		6 44.6		341 33.7		0 46.4		329 10.6		-5 10.9	
2 0	38 59.6	288.4	20 53.2	-2.6	25 11.5	288.7	17 7.9	-3.7	11 50.0	289.1	12 16.4	-4.4	358 56.2	289.4	6 39.8	-4.9	346 23.3	289.6	0 41.4	-5.0	334 0.3	289.7	-5 15.7	-4.9
20	43 47.9		20 50.6		30 0.2		17 4.2		16 39.1		12 11.9		3 45.6		6 34.9		351 13.0		0 36.4		338 50.0		-5 20.6	
40	48 36.3		20 48.0		34 48.9		17 0.6		21 28.2		12 7.5		8 35.0		6 30.0		356 2.6		0 31.4		343 39.7		-5 25.4	
3 0	53 24.6	288.4	20 45.4	-2.7	39 37.6	288.7	16 56.9	-3.7	26 17.3	289.1	12 3.1	-4.5	13 24.5	289.4	6 25.1	-4.9	0 52.3	289.6	0 26.3	-5.0	348 29.4	289.7	-5 30.3	-4.8
20	58 13.0		20 42.7		44 26.3		16 53.2		31 6.3		11 58.6		18 13.9		6 20.2		5 41.9		0 21.3		353 19.1		-5 35.1	
40	63 1.4		20 40.1		49 15.0		16 49.5		35 55.4		11 54.2		23 3.3		6 15.3		10 31.5		0 16.3		358 8.8		-5 39.9	
4 0	67 49.7	288.4	20 37.4	-2.7	54 3.7	288.7	16 45.8	-3.7	40 44.5	289.1	11 49.7	-4.5	27 52.8	289.5	6 10.4	-4.9	15 21.2	289.7	0 11.3	-5.0	2 58.4	289.7	-5 44.8	-4.8
20	72 38.1		20 34.7		58 52.4		16 42.1		45 33.6		11 45.2		32 42.2		6 5.5		20 10.8		0 6.3		7 48.1		-5 49.6	
40	77 26.5		20 32.0		63 41.1		16 38.4		50 22.7		11 40.8		37 31.7		6 0.6		25 0.5		0 1.3		12 37.8		-5 54.4	
5 0	82 14.9	288.4	20 29.3	-2.8	68 29.8	288.7	16 34.7	-3.8	55 11.9	289.1	11 36.3	-4.5	42 21.1	289.5	5 55.7	-4.9	29 50.2	289.7	-0 3.8	-5.0	17 27.5	289.7	-5 59.2	-4.8
20	87 3.3		20 26.5		73 18.5		16 30.9		60 1.0		11 31.8		47 10.6		5 50.8		34 39.8		-0 8.8		22 17.2		-6 4.0	
40	91 51.7		20 23.8		78 7.2		16 27.1		64 50.1		11 27.3		52 0.1		5 45.8		39 29.5		-0 13.8		27 6.9		-6 8.8	
6 0	96 40.1	288.4	20 21.0	-2.8	82 56.0	288.7	16 23.4	-3.8	69 39.2	289.1	11 22.8	-4.5	56 49.5	289.5	5 40.9	-4.9	44 19.1	289.7	-0 18.8	-5.0	31 56.6	289.7	-6 13.6	-4.8
20	101 28.5		20 18.2		87 44.7		16 19.6		74 28.4		11 18.3		61 39.0		5 36.0		49 8.8		-0 23.8		36 46.2		-6 18.4	
40	106 16.9		20 15.4		92 33.4		16 15.8		79 17.5		11 13.7		66 28.5		5 31.0		53 58.5		-0 28.8		41 35.9		-6 23.2	
7 0	111 5.3	288.4	20 12.6	-2.8	97 22.2	288.8	16 12.0	-3.9	84 6.7	289.2	11 9.2	-4.6	71 17.9	289.5	5 26.1	-4.9	58 48.1	289.7	-0 33.8	-5.0	46 25.6	289.7	-6 28.0	-4.8
20	115 53.7		20 9.8		102 10.9		16 8.1		88 55.8		11 4.6		76 7.4		5 21.2		63 37.8		-0 38.8		51 15.3		-6 32.7	
40	120 42.1		20 6.9		106 59.7		16 4.3		93 45.0		11 0.1		80 56.9		5 16.2		68 27.5		-0 43.9		56 5.0		-6 37.5	
8 0	125 30.5	288.4	20 4.1	-2.9	111 48.5	288.8	16 0.4	-3.9	98 34.1	289.2	10 55.5	-4.6	85 46.4	289.5	5 11.3	-5.0	73 17.1	289.7	-0 48.9	-5.0	60 54.6	289.7	-6 42.3	-4.8
20	130 18.9		20 1.2		116 37.2		15 56.6		103 23.3		10 51.0		90 35.9		5 6.3		78 6.8		-0 53.9		65 44.3		-6 47.0	
40	135 7.3		19 58.3		121 26.0		15 52.7		108 12.5		10 46.4		95 25.4		5 1.4		82 56.5		-0 58.9		70 34.0		-6 51.8	
9 0	139 55.8	288.4	19 55.4	-2.9	126 14.8	288.8	15 48.8	-3.9	113 1.6	289.2	10 41.8	-4.6	100 14.9	289.5	4 56.4	-4.9	87 46.1	289.7	-1 3.9	-5.0	75 23.7	289.7	-6 56.6	-4.7
20	144 44.2		19 52.5		131 3.6		15 44.9		117 50.8		10 37.2		105 4.4		4 51.5		92 35.8		-1 8.9		80 13.3		-7 1.3	
40	149 32.6		19 49.5		135 52.4		15 41.0		122 40.0		10 32.6		109 53.9		4 46.5		97 25.5		-1 13.9		85 3.0		-7 6.0	
10 0	154 21.1	288.4	19 46.6	-3.0	140 41.2	288.8	15 37.1	-3.9	127 29.2	289.2	10 28.0	-4.6	114 43.4	289.5	4 41.6	-5.0	102 15.2	289.7	-1 18.9	-5.0	89 52.7	289.7	-7 10.8	-4.7
20	159 9.5		19 43.6		145 30.0		15 33.2		132 18.4		10 23.4		119 32.9		4 36.6		107 4.8		-1 23.9		94 42.4		-7 15.5	
40	163 58.0		19 40.6		150 18.8		15 29.2		137 7.6		10 18.8		124 22.4		4 31.6		111 54.5		-1 28.9		99 32.0		-7 20.2	
11 0	168 46.4	288.5	19 37.6	-3.0	155 7.6	288.8	15 25.3	-4.0	141 56.8	289.2	10 14.2	-4.6	129 11.9	289.5	4 26.7	-5.0	116 44.2	289.7	-1 33.8	-5.0	104 21.7	289.7	-7 24.9	-4.7
20	173 34.9		19 34.6		159 56.4		15 21.3		146 46.0		10 9.6		134 1.5		4 21.7		121 33.9		-1 38.8		109 11.4		-7 29.7	
40	178 23.3		19 31.6		164 45.2		15 17.3		151 35.2		10 4.9		138 51.0		4 16.7		126 23.6		-1 43.8		114 1.0		-7 34.4	
12 0	183 11.8	288.5	19 28.5	-3.1	169 34.1	288.8	15 13.3	-4.0	156 24.5	289.2	10 0.3	-4.7	143 40.5	289.5	4 11.7	-5.0	131 13.2	289.7	-1 48.8	-5.0	118 50.7	289.7	-7 39.1	-4.7
20	188 0.3		19 25.5		174 22.9		15 9.3		161 13.7		9 55.6		148 30.1		4 6.8		136 2.9		-1 53.8		123 40.4		-7 43.7	
40	192 48.8		19 22.4		179 11.8		15 5.3		166 2.9		9 51.0		153 19.6		4 1.8		140 52.6		-1 58.8		128 30.0		-7 48.4	
13 0	197 37.2	288.5	19 19.3	-3.1	184 0.6	288.9	15 1.3	-4.0	170 52.2	289.2	9 46.3	-4.7	158 9.1	289.5	3 56.8	-5.0	145 42.3	289.7	-2 3.8	-5.0	133 19.7	289.7	-7 53.1	-4.7
20	202 25.7		19 16.2		188 49.5		14 57.3		175 41.4		9 41.6		162 58.7		3 51.8		150 32.0		-2 8.7		138 9.3		-7 57.8	
40	207 14.2		19 13.1		193 38.3		14 53.2		180 30.7		9 36.9		167 48.2		3 46.8		155 21.7		-2 13.7		142 59.0		-8 2.5	
14 0	212 2.7	288.5	19 10.0	-3.2	198 27.2	288.9	14 49.2	-4.1	185 19.9	289.3	9 32.3	-4.7	172 37.8	289.6	3 41.8	-5.0	160 11.4	289.7	-2 18.7	-5.0	147 48.6	289.7	-8 7.1	-4.7
20	216 51.2		19 6.8		203 16.1		14 45.1		190 9.2		9 27.6		177 27.3		3 36.8		165 1.0		-2 23.7		152 38.3		-8 11.8	
40	221 39.7		19 3.6		208 4.9		14 41.0		194 58.4		9 22.9		182 16.9		3 31.8		169 50.7		-2 28.6		157 27.9		-8 16.4	
15 0	226 28.2	288.5	19 0.5	-3.2	212 53.8	288.9	14 36.9	-4.1	199 47.7	289.3	9 18.2	-4.7	187 6.4	289.6	3 26.9	-5.0	174 40.4	289.7	-2 33.6	-5.0	162 17.6	289.6	-8 21.1	-4.6
20	231 16.7		18 57.3		217 42.7		14 32.8		204 37.0		9 13.4		191 56.0		3 21.9		179 30.1		-2 38.6		167 7.2		-8 25.7	
40	236 5.2		18 54.1		222 31.6		14 28.7		209 26.3		9 8.7		196 45.6		3 16.9		184 19.8		-2 43.5		171 56.9		-8 30.3	
16 0	240 53.7	288.5	18 50.9	-3.3	227 20.5	288.9	14 24.6	-4.1	214 15.5	289.3	9 4.0	-4.7	201 35.1	289.6	3 11.9	-5.0	189 9.5	289.7	-2 48.5	-4.9	176 46.5	289.6	-8 35.0	-4.6
20	245 42.3		18 47.6		232 9.4		14 20.5		219 4.8		8 59.3		206 24.7		3 6.9		193 59.2		-2 53.4		181 36.2		-8 39.6	
40	250 30.8		18 44.4		236 58.3		14 16.3		223 54.1		8 54.5		211 14.3		3 1.9		198 48.9		-2 58.4		186 25.8		-8 44.2	
17 0	255 19.3	288.5	18 41.1	-3.3	241 47.2	288.9	14 12.2	-4.2	228 43.4	289.3	8 49.8	-4.8	216 3.8	289.6	2 56.8	-5.0	203 38.6	289.7	-3 3.3	-5.0	191 15.5	289.6	-8 48.8	-4.6
20	260 7.9		18 37.8		246 36.1		14 8.0		233 32.7		8 45.1		220 53.4		2 51.8		208 28.3		-3 8.3		196 5.1		-8 53.4	
40	264 56.4		18 34.6		251 25.1		14 3.8		238 22.0		8 40.3		225 43.0		2 46.8		213 18.0		-3 13.2		200 54.7		-8 58.0	
18 0	269 44.9	288.6	18 31.2	-3.3	256 14.0	288.9	13 59.7	-4.2	243 11.3	289.3	8 35.5	-4.8	230 32.6	289.6	2 41.8	-5.0	218 7.7	289.7	-3 18.2	-4.9	205 44.4	289.6	-9 2.6	-4.6
20	274 33.5		18 27.9		261 2.9		13 55.5		248 0.7		8 30.8		235 22.2		2 36.8		222 57.3		-3 23.1		210 34.0		-9 7.2	
40	279 22.1		18 24.6		265 51.9		13 51.3		252 50.0		8 26.0		240 11.8		2 31.8		227 47.0		-3 28.0		215 23.6		-9 11.7	
19 0	284 10.6	288.6	18 21.3	-3.4	270 40.8	289.0	13 47.0	-4.2	257 39.3	289.3	8 21.2	-4.8	245 1.3	289.6	2 26.8	-5.0	232 36.7	289.7	-3 33.0	-4.9	220 13.2	289.6	-9 16.3	-4.6
20	288 59.2		18 17.9		275 29.8		13 42.8		262 28.6		8 16.4		249 50.9		2 21.8		237 26.4		-3 37.9		225 2.9		-9 20.9	
40	293 47.7		18 14.5		280 18.7		13 38.6		267 18.0		8 11.7		254 40.5		2 16.8		242 16.1		-3 42.8		229 52.5		-9 25.4	
20 0	298 36.3	288.6	18 11.1	-3.4	285 7.7	289.0	13 34.3	-4.2	272 7.3	289.3	8 6.9	-4.8	259 30.1	289.6	2 11.8	-5.0	247 5.8	289.7	-3 47.8	-4.9	234 42.1	289.6	-9 30.0	-4.5
20	303 24.9		18 7.7		289 56.7		13 30.1		276 56.7		8 2.1		264 19.7		2 6.7		251 55.5		-3 52.7		239 31.7		-9 34.5	
40	308 13.5		18 4.3		294 45.6		13 25.8		281 46.0		7 57.3		269 9.3		2 1.7		256 45.2		-3 57.6		244 21.4		-9 39.0	
21 0	313 2.1	288.6	18 0.9	-3.5	299 34.6	289.0	13 21.6	-4.3	286 35.4	289.4	7 52.5	-4.8	273 58.9	289.6	1 56.7	-5.0	261 34.9	289.7	-4 2.5	-4.9	249 11.0	289.6	-9 43.5	-4.5
20	317 50.7		17 57.4		304 23.6		13 17.3		291 24.7		7 47.6		278 48.6		1 51.7		266 24.6		-4 7.4		254 0.6		-9 48.1	
40	322 39.3		17 54.0		309 12.6		13 13.0		296 14.1		7 42.8		283 38.2		1 46.7		271 14.3		-4 12.3		258 50.2		-9 52.6	
22 0	327 27.9	288.6	17 50.5	-3.5	314 1.6	289.0	13 8.7	-4.3	301 3.4	289.4	7 38.0	-4.8	288 27.8	289.6	1 41.6	-5.0	276 4.0	289.7	-4 17.2	-4.9	263 39.8	289.6	-9 57.1	-4.5
20	332 16.5		17 47.0		318 50.6		13 4.4		305 52.8		7 33.2		293 17.4		1 36.6		280 53.7		-4 22.1		268 29.4		-10 1.6	
40	337 5.1		17 43.5		323 39.6		13 0.1		310 42.2		7 28.3		298 7.0		1 31.6		285 43.4		-4 27.0		273 19.0		-10 6.0	
23 0	341 53.7	288.6	17 40.0	-3.5	328 28.6	289.0	12 55.7	-4.3	315 31.6	289.4	7 23.5	-4.8	302 56.6	289.6	1 26.6	-5.0	290 33.1	289.7	-4 31.9	-4.9	278 8.6	289.6	-10 10.5	-4.5
20	346 42.4		17 36.5		333 17.7		12 51.4		320 21.0		7 18.7		307 46.3		1 21.6		295 22.8		-4 36.8		282 58.2		-10 15.0	
40	351 31.0		17 33.0		338 6.7		12 47.0		325 10.3		7 13.8		312 35.9		1 16.5		300 12.5		-4 41.7		287 47.8		-10 19.5	

2011 Moon

	25 Jan						26 Jan						27 Jan						28 Jan						29 Jan						30 Jan					
	GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec		
h m	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'
0 0	292	37.4	289.6	-10	23.9	-4.4	280	0.7	289.4	-15	21.6	-3.8	267	5.5	289.1	-19	23.5	-2.9	253	52.3	288.9	-22	16.5	-1.9	240	28.7	288.8	-23	52.0	-0.8	227	8.7	289.0	-24	6.9	0.4
20	297	27.0		-10	28.4		284	50.0		-15	25.4		271	54.6		-19	26.4		258	41.1		-22	18.4		245	17.5		-23	52.8		231	57.6		-24	6.5	
40	302	16.6		-10	32.8		289	39.4		-15	29.2		276	43.7		-19	29.3		263	30.0		-22	20.2		250	6.3		-23	53.5		236	46.6		-24	6.2	
1 0	307	6.2	289.6	-10	37.2	-4.4	294	28.7	289.4	-15	32.9	-3.7	281	32.8	289.1	-19	32.2	-2.8	268	18.9	288.9	-22	22.1	-1.8	254	55.1	288.8	-23	54.3	-0.7	241	35.6	289.0	-24	5.8	0.4
20	311	55.8		-10	41.6		299	18.1		-15	36.7		286	21.9		-19	35.0		273	7.8		-22	23.9		259	44.0		-23	55.0		246	24.6		-24	5.4	
40	316	45.3		-10	46.1		304	7.5		-15	40.4		291	11.0		-19	37.9		277	56.6		-22	25.7		264	32.8		-23	55.7		251	13.6		-24	5.0	
2 0	321	34.9	289.6	-10	50.5	-4.4	308	56.8	289.3	-15	44.1	-3.7	296	0.1	289.1	-19	40.7	-2.8	282	45.5	288.9	-22	27.5	-1.8	269	21.6	288.8	-23	56.4	-0.6	256	2.7	289.0	-24	4.5	0.4
20	326	24.5		-10	54.9		313	46.2		-15	47.8		300	49.1		-19	43.5		287	34.4		-22	29.3		274	10.5		-23	57.0		260	51.7		-24	4.1	
40	331	14.1		-10	59.3		318	35.5		-15	51.5		305	38.2		-19	46.3		292	23.3		-22	31.1		278	59.3		-23	57.7		265	40.7		-24	3.6	
3 0	336	3.7	289.6	-11	3.6	-4.4	323	24.8	289.3	-15	55.2	-3.7	310	27.3	289.1	-19	49.1	-2.8	297	12.1	288.9	-22	32.8	-1.7	283	48.1	288.8	-23	58.3	-0.6	270	29.7	289.0	-24	3.2	0.5
20	340	53.2		-11	8.0		328	14.2		-15	58.9		315	16.3		-19	51.9		302	1.0		-22	34.6		288	37.0		-23	58.9		275	18.7		-24	2.7	
40	345	42.8		-11	12.4		333	3.5		-16	2.6		320	5.4		-19	54.7		306	49.9		-22	36.3		293	25.8		-23	59.5		280	7.8		-24	2.2	
4 0	350	32.4	289.6	-11	16.8	-4.3	337	52.8	289.3	-16	6.2	-3.6	324	54.5	289.1	-19	57.4	-2.7	311	38.7	288.9	-22	38.0	-1.7	298	14.6	288.8	-24	0.1	-0.6	284	56.8	289.0	-24	1.7	0.6
20	355	21.9		-11	21.1		342	42.1		-16	9.9		329	43.5		-20	0.1		316	27.6		-22	39.7		303	3.5		-24	0.7		289	45.8		-24	1.1	
40	0	11.5		-11	25.4		347	31.5		-16	13.5		334	32.6		-20	2.9		321	16.4		-22	41.3		307	52.3		-24	1.2		294	34.9		-24	0.6	
5 0	5	1.0	289.6	-11	29.8	-4.3	352	20.8	289.3	-16	17.1	-3.6	339	21.6	289.0	-20	5.6	-2.7	326	5.3	288.9	-22	43.0	-1.6	312	41.2	288.8	-24	1.8	-0.5	299	23.9	289.1	-24	0.0	0.6
20	9	50.6		-11	34.1		357	10.1		-16	20.7		344	10.7		-20	8.3		330	54.2		-22	44.6		317	30.0		-24	2.3		304	13.0		-23	59.4	
40	14	40.1		-11	38.4		1	59.4		-16	24.3		348	59.7		-20	11.0		335	43.0		-22	46.3		322	18.8		-24	2.8		309	2.0		-23	58.8	
6 0	19	29.7	289.5	-11	42.7	-4.3	6	48.7	289.3	-16	27.9	-3.6	353	48.7	289.0	-20	13.6	-2.6	340	31.9	288.8	-22	47.9	-1.6	327	7.7	288.8	-24	3.3	-0.5	313	51.1	289.1	-23	58.2	0.6
20	24	19.2		-11	47.0		11	38.0		-16	31.5		358	37.8		-20	16.3		345	20.7		-22	49.5		331	56.5		-24	3.8		318	40.2		-23	57.6	
40	29	8.8		-11	51.3		16	27.3		-16	35.0		3	26.8		-20	18.9		350	9.6		-22	51.1		336	45.4		-24	4.2		323	29.2		-23	57.0	
7 0	33	58.3	289.5	-11	55.6	-4.3	21	16.6	289.3	-16	38.6	-3.5	8	15.8	289.0	-20	21.5	-2.6	354	58.4	288.8	-22	52.6	-1.6	341	34.2	288.9	-24	4.7	-0.4	328	18.3	289.1	-23	56.3	0.7
20	38	47.9		-11	59.9		26	5.9		-16	42.1		13	4.8		-20	24.2		359	47.3		-22	54.2		346	23.1		-24	5.1		333	7.4		-23	55.6	
40	43	37.4		-12	4.2		30	55.2		-16	45.7		17	53.9		-20	26.8		4	36.1		-22	55.7		351	11.9		-24	5.5		337	56.5		-23	55.0	
8 0	48	26.9	289.5	-12	8.4	-4.2	35	44.5	289.3	-16	49.2	-3.5	22	42.9	289.0	-20	29.3	-2.6	9	24.9	288.8	-22	57.3	-1.5	356	0.8	288.9	-24	5.9	-0.4	342	45.6	289.1	-23	54.3	0.7
20	53	16.4		-12	12.7		40	33.7		-16	52.7		27	31.9		-20	31.9		14	13.8		-22	58.8		0	49.7		-24	6.3		347	34.7		-23	53.6	
40	58	6.0		-12	16.9		45	23.0		-16	56.2		32	20.9		-20	34.5		19	2.6		-23	0.2		5	38.5		-24	6.7		352	23.8		-23	52.8	
9 0	62	55.5	289.5	-12	21.1	-4.2	50	12.3	289.3	-16	59.6	-3.5	37	9.9	289.0	-20	37.0	-2.5	23	51.5	288.8	-23	1.7	-1.5	10	27.4	288.9	-24	7.0	-0.3	357	12.9	289.1	-23	52.1	0.8
20	67	45.0		-12	25.4		55	1.5		-17	3.1		41	58.9		-20	39.5		28	40.3		-23	3.2		15	16.2		-24	7.4		2	2.0		-23	51.3	
40	72	34.5		-12	29.6		59	50.8		-17	6.6		46	47.9		-20	42.1		33	29.1		-23	4.6		20	5.1		-24	7.7		6	51.1		-23	50.6	
10 0	77	24.0	289.5	-12	33.8	-4.2	64	40.1	289.3	-17	10.0	-3.4	51	36.9	289.0	-20	44.6	-2.5	38	18.0	288.8	-23	6.1	-1.4	24	54.0	288.9	-24	8.0	-0.3	11	40.2	289.1	-23	49.8	0.8
20	82	13.6		-12	38.0		69	29.3		-17	13.5		56	25.9		-20	47.0		43	6.8		-23	7.5		29	42.8		-24	8.3		16	29.3		-23	49.0	
40	87	3.1		-12	42.2		74	18.6		-17	16.9		61	14.9		-20	49.5		47	55.7		-23	8.9		34	31.7		-24	8.6		21	18.5		-23	48.2	
11 0	91	52.6	289.5	-12	46.3	-4.2	79	7.8	289.2	-17	20.3	-3.4	66	3.9	289.0	-20	52.0	-2.4	52	44.5	288.8	-23	10.3	-1.3	39	20.6	288.9	-24	8.8	-0.2	26	7.6	289.1	-23	47.3	0.8
20	96	42.1		-12	50.5		83	57.1		-17	23.7		70	52.9		-20	54.4		57	33.3		-23	11.6		44	9.4		-24	9.1		30	56.7		-23	46.5	
40	101	31.6		-12	54.7		88	46.3		-17	27.1		75	41.9		-20	56.9		62	22.2		-23	13.0		48	58.3		-24	9.3		35	45.9		-23	45.6	
12 0	106	21.1	289.5	-12	58.8	-4.1	93	35.5	289.2	-17	30.4	-3.4	80	30.8	289.0	-20	59.3	-2.4	67	11.0	288.8	-23	14.3	-1.3	53	47.2	288.9	-24	9.5	-0.2	40	35.0	289.2	-23	44.8	0.9
20	111	10.6		-13	2.9		98	24.8		-17	33.8		85	19.8		-21	1.7		71	59.8		-23	15.6		58	36.1		-24	9.7		45	24.2		-23	43.9	
40	116	0.0		-13	7.1		103	14.0		-17	37.1		90	8.8		-21	4.1		76	48.6		-23	16.9		63	25.0		-24	9.9		50	13.4		-23	43.0	
13 0	120	49.5	289.5	-13	11.2	-4.1	108	3.2	289.2	-17	40.5	-3.3	94	57.8	289.0	-21	6.4	-2.4	81	37.5	288.8	-23	18.2	-1.3	68	13.8	288.9	-24	10.1	-0.1	55	2.5	289.2	-23	42.1	1.0
20	125	39.0		-13	15.3		112	52.5		-17	43.8		99	46.7		-21	8.8		86	26.3		-23	19.5		73	2.7		-24	10.2		59	51.7		-23	41.1	
40	130	28.5		-13	19.4		117	41.7		-17	47.1		104	35.7		-21	11.1		91	15.1		-23	20.8		77	51.6		-24	10.3		64	40.9		-23	40.2	
14 0	135	18.0	289.5	-13	23.5	-4.1	122	30.9	289.2	-17	50.4	-3.3	109	24.7	289.0	-21	13.5	-2.3	96	4.0	288.8	-23	22.0	-1.2	82	40.5	288.9	-24	10.5	-0.1	69	30.0	289.2	-23	39.2	1.0
20	140	7.4		-13	27.6		127	20.1		-17	53.7		114	13.6		-21	15.8		100	52.8		-23	23.2		87	29.4		-24	10.6		74	19.2		-23	38.3	
40	144	56.9		-13	31.7		132	9.3		-17	57.0		119	2.6		-21	18.1		105	41.6		-23	24.4		92	18.3		-24	10.7		79	8.4		-23	37.3	
15 0	149	46.4	289.5	-13	35.7	-4.1	136	58.5	289.2	-18	0.2	-3.3	123	51.5	288.9	-21	20.4	-2.2	110	30.4	288.8	-23	25.6	-1.2	97	7.2	288.9	-24	10.7	-0.1	83	57.6	289.2	-23	36.3	1.0
20	154	35.8		-13	39.8		141	47.7		-18	3.5		128	40.5		-21	22.6		115	19.3		-23	26.8		101	56.1		-24	10.8		88	46.8		-23	35.3	
40	159	25.3		-13	43.8		146	36.9		-18	6.7		133	29.4		-21	24.9		120	8.1		-23	28.0		106	45.0		-24	10.8		93	36.0		-23	34.2	
16 0	164	14.7	289.5	-13	47.9	-4.0	151	26.1	289.2	-18	10.0	-3.2	138	18.4	288.9	-21	27.1	-2.2	124	56.9	288.8	-23	29.1	-1.1	111	33.9	288.9	-24	10.9	0.0	98	25.3	289.2	-23	33.2	1.1
20	169	4.2		-13	51.9		156	15.3		-18	13.2		143	7.3		-21	29.4		129	45.7		-23	30.3		116	22.8		-24	10.9		103	14.5		-23	32.1	
40	173	53.7		-13	55.9		161	4.4		-18	16.4		147	56.2		-21	31.6		134	34.5		-23	31.4		121	11.7		-24	10.9		108	3.7		-23	31.1	
17 0	178	43.1	289.4	-13	59.9	-4.0	165	53.6	289.2	-18	19.6	-3.1	152	45.2	288.9	-21	33.8	-2.2	139	23.4	288.8	-23	32.5	-1.1	126	0.7	288.9	-24	10.8	0.0	112	52.9	289.2	-23	30.0	1.1
20	183	32.5		-14	3.9		170	42.8		-18	22.7		157	34.1		-21	36.0		144	12.2		-23	33.6		130	49.6		-24	10.8		117	42.2		-23	28.9	
40	188	22.0		-14	7.9		175	32.0		-18	25.9		162	23.0		-21	38.1		149	1.0		-23	34.6		135	38.5		-24	10.8		122	31.4		-23	27.8	
18 0	193	11.4	289.4	-14	11.9	-3.9	180	21.1	289.2	-18	29.0	-3.1	167	12.0	288.9	-21	40.3	-2.1	153	49.8	288.8	-23	35.7	-1.0	140	27.4	288.9	-24	10.7	0.1	127	20.7	289.3	-23	26.7	1.2
20	198	0.8		-14	15.8		185	10.3		-18	32.2		172	0.9		-21	42.4		158	38.7		-23	36.7		145	16.4		-24	10.6		132	9.9		-23	25.5	
40	202	50.3		-14	19.8		189	59.5		-18	35.3		176	49.8		-21	44.5		163	27.5		-23	37.8		150	5.3		-24	10.5		136	59.2		-23	24.4	
19 0	207	39.7	289.4	-14	23.7	-3.9	194	48.6	289.1	-18	38.4	-3.1	181	38.7	288.9	-21	46.6	-2.1	168	16.3	288.8	-23	38.8	-1.0	154	54.2	288.9	-24	10.4	0.1	141	48.4	289.3	-23	23.2	1.2
20	212	29.1		-14	27.6		199	37.8		-18	41.5		186	27.7		-21	48.7		173	5.1		-23	39.8		159	43.2		-24	10.3		146	37.7		-23	22.0	
40	217	18.5		-14	31.6		204	26.9		-18	44.6		191	16.6		-21	50.8		177	53.9		-23	40.8		164	32.1		-24	10.1		151	27.0		-23	20.8	
20 0	222	8.0	289.4	-14	35.5	-3.9	209	16.1	289.1	-18	47.7	-3.0	196	5.5	288.9	-21	52.9	-2.0	182	42.8	288.8	-23	41.7	-0.9	169	21.1	289.0	-24	10.0	0.2	156	16.3	289.3	-23	19.6	1.2
20	226	57.4		-14	39.4		214	5.2		-18	50.7		200	54.4		-21	54.9		187	31.6		-23	42.7		174	10.0		-24	9.8		161	5.6		-23	18.4	
40	231	46.8		-14	43.3		218	54.3		-18	53.8		205	43.3		-21	57.0		192	20.4		-23	43.6		178	58.9		-24	9.6		165	54.9		-23	17.2	
21 0	236	36.2	289.4	-14	47.2	-3.8	223	43.5	289.1	-18	56.8	-3.0	210	32.2	288.9	-21	59.0	-2.0	197	9.2	288.8	-23	44.5	-0.9	183	47.9	289.0	-24	9.4	0.2	170	44.2	289.3	-23	15.9	1.3
20	241	25.6		-14	51.0		228	32.6		-18	59.8		215	21.1		-22	1.0		201	58.1		-23	45.4		188	36.9		-24	9.2		175	33.5		-23	14.6	
40	246	15.0		-14	54.9		233	21.7		-19	2.8		220	10.0		-22	3.0		206	46.9		-23	46.3		193	25.8		-24	9.0		180	22.8		-23	13.4	
22 0	251	4.4	289.4	-14	58.7	-3.8	238	10.9	289.1	-19	5.8	-3.0	224	58.9	288.9	-22	5.0	-1.9	211	35.7	288.8	-23	47.2	-0.8	198	14.8	289.0	-24	8.7	0.3	185	12.1	289.3	-23	12.1	1.3
20	255	53.8		-15	2.6		242	60.0		-19	8.8		229	47.8		-22	6.9		216	24.5		-23	48.0		203	3.8		-24	8.4		190	1.4		-23	10.8	
40	260	43.1		-15	6.4		247	49.1		-19	11.8		234	36.7		-22	8.9		221	13.4		-23	48.9		207	52.7		-24	8.2		194	50.8		-23	9.4	
23 0	265	32.5	289.4	-15	10.2	-3.8	252	38.2	289.1	-19	14.7	-2.9	239	25.6	288.9	-22	10.8	-1.9	226	2.2	288.8	-23	49.7	-0.8	212	41.7	289.0	-24	7.9	0.3	199	40.1	289.4	-23	8.1	1.4
20	270	21.9		-15	14.0		257	27.3		-19	17.6		244	14.5		-22	12.7		230	51.0		-23	50.5		217	30.7		-24	7.6		204	29.5		-23	6.8	
40	275	11.3		-15	17.8		262	16.4		-19	20.6		249	3.4		-22	14.6		235	39.8		-23	51.3		222	19.7		-24	7.2		209	18.8		-23	5.4	

2011 Moon

	31 Jan						1 Feb						2 Feb						3 Feb						4 Feb						5 Feb					
	GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec		
h m	°	'	d	°	'	d '	°	'	d	°	'	d '	°	'	d	°	'	d '	°	'	d	°	'	d '	°	'	d	°	'	d '	°	'	d	°	'	d '
0 0	214	8.2	289.4	-23	4.0	1.4	201	40.3	289.9	-20	51.8	2.3	189	51.8	290.5	-17	42.1	3.0	178	42.8	291.0	-13	48.5	3.5	168	8.2	291.4	-9	24.2	3.8	157	59.2	291.7	-4	41.6	4.0
20	218	57.5		-23	2.6		206	30.2		-20	49.5		194	42.2		-17	39.1		183	33.8		-13	45.0		172	59.6		-9	20.4		162	50.9		-4	37.6	
40	223	46.9		-23	1.2		211	20.0		-20	47.2		199	32.7		-17	36.1		188	24.8		-13	41.5		177	51.0		-9	16.6		167	42.5		-4	33.6	
1 0	228	36.3	289.4	-22	59.8	1.4	216	9.9	289.9	-20	44.9	2.3	204	23.1	290.5	-17	33.2	3.0	193	15.8	291.0	-13	38.0	3.5	182	42.4	291.4	-9	12.7	3.8	172	34.2	291.7	-4	29.6	4.0
20	233	25.7		-22	58.4		220	59.8		-20	42.6		209	13.6		-17	30.1		198	6.7		-13	34.5		187	33.8		-9	8.9		177	25.9		-4	25.6	
40	238	15.1		-22	57.0		225	49.8		-20	40.3		214	4.1		-17	27.1		202	57.7		-13	31.0		192	25.2		-9	5.1		182	17.6		-4	21.5	
2 0	243	4.5	289.4	-22	55.5	1.5	230	39.7	289.9	-20	38.0	2.4	218	54.6	290.5	-17	24.1	3.0	207	48.7	291.0	-13	27.5	3.5	197	16.6	291.4	-9	1.2	3.8	187	9.3	291.7	-4	17.5	4.0
20	247	53.9		-22	54.0		235	29.6		-20	35.6		223	45.1		-17	21.1		212	39.7		-13	23.9		202	8.0		-8	57.4		192	1.0		-4	13.5	
40	252	43.3		-22	52.6		240	19.5		-20	33.3		228	35.6		-17	18.1		217	30.8		-13	20.4		206	59.4		-8	53.5		196	52.7		-4	9.5	
3 0	257	32.7	289.4	-22	51.1	1.5	245	9.5	290.0	-20	30.9	2.4	233	26.1	290.5	-17	15.0	3.1	222	21.8	291.0	-13	16.9	3.6	211	50.9	291.4	-8	49.7	3.9	201	44.4	291.7	-4	5.5	4.0
20	262	22.1		-22	49.6		249	59.4		-20	28.6		238	16.6		-17	12.0		227	12.8		-13	13.3		216	42.3		-8	45.8		206	36.1		-4	1.5	
40	267	11.6		-22	48.1		254	49.4		-20	26.2		243	7.1		-17	8.9		232	3.8		-13	9.8		221	33.7		-8	41.9		211	27.8		-3	57.5	
4 0	272	1.0	289.5	-22	46.5	1.6	259	39.4	290.0	-20	23.8	2.4	247	57.6	290.5	-17	5.8	3.1	236	54.9	291.1	-13	6.2	3.6	226	25.2	291.5	-8	38.1	3.9	216	19.5	291.7	-3	53.5	4.0
20	276	50.4		-22	45.0		264	29.3		-20	21.4		252	48.2		-17	2.8		241	45.9		-13	2.7		231	16.6		-8	34.2		221	11.2		-3	49.4	
40	281	39.9		-22	43.4		269	19.3		-20	19.0		257	38.7		-16	59.7		246	37.0		-12	59.1		236	8.1		-8	30.3		226	2.9		-3	45.4	
5 0	286	29.3	289.5	-22	41.8	1.6	274	9.3	290.0	-20	16.6	2.5	262	29.3	290.6	-16	56.6	3.1	251	28.0	291.1	-12	55.5	3.6	240	59.5	291.5	-8	26.5	3.9	230	54.6	291.7	-3	41.4	4.0
20	291	18.8		-22	40.3		278	59.3		-20	14.1		267	19.8		-16	53.5		256	19.1		-12	52.0		245	51.0		-8	22.6		235	46.3		-3	37.4	
40	296	8.3		-22	38.7		283	49.3		-20	11.7		272	10.4		-16	50.4		261	10.2		-12	48.4		250	42.5		-8	18.7		240	38.0		-3	33.4	
6 0	300	57.8	289.5	-22	37.1	1.7	288	39.3	290.0	-20	9.2	2.5	277	1.0	290.6	-16	47.3	3.1	266	1.2	291.1	-12	44.8	3.6	255	33.9	291.5	-8	14.8	3.9	245	29.7	291.7	-3	29.3	4.0
20	305	47.2		-22	35.4		293	29.4		-20	6.8		281	51.5		-16	44.2		270	52.3		-12	41.2		260	25.4		-8	11.0		250	21.5		-3	25.3	
40	310	36.7		-22	33.8		298	19.4		-20	4.3		286	42.1		-16	41.0		275	43.4		-12	37.6		265	16.9		-8	7.1		255	13.2		-3	21.3	
7 0	315	26.2	289.5	-22	32.1	1.7	303	9.4	290.1	-20	1.8	2.5	291	32.7	290.6	-16	37.9	3.2	280	34.5	291.1	-12	34.0	3.6	270	8.4	291.5	-8	3.2	3.9	260	4.9	291.7	-3	17.3	4.0
20	320	15.7		-22	30.5		307	59.5		-19	59.3		296	23.3		-16	34.8		285	25.6		-12	30.4		274	59.8		-7	59.3		264	56.6		-3	13.2	
40	325	5.3		-22	28.8		312	49.5		-19	56.8		301	14.0		-16	31.6		290	16.7		-12	26.8		279	51.3		-7	55.4		269	48.4		-3	9.2	
8 0	329	54.8	289.5	-22	27.1	1.7	317	39.6	290.1	-19	54.3	2.5	306	4.6	290.6	-16	28.4	3.2	295	7.8	291.1	-12	23.2	3.6	284	42.8	291.5	-7	51.5	3.9	274	40.1	291.7	-3	5.2	4.0
20	334	44.3		-22	25.4		322	29.7		-19	51.8		310	55.2		-16	25.3		299	59.0		-12	19.5		289	34.3		-7	47.6		279	31.8		-3	1.2	
40	339	33.8		-22	23.7		327	19.7		-19	49.2		315	45.8		-16	22.1		304	50.1		-12	15.9		294	25.8		-7	43.7		284	23.6		-2	57.1	
9 0	344	23.4	289.6	-22	22.0	1.8	332	9.8	290.1	-19	46.7	2.6	320	36.5	290.7	-16	18.9	3.2	309	41.2	291.1	-12	12.3	3.6	299	17.4	291.5	-7	39.8	3.9	289	15.3	291.7	-2	53.1	4.0
20	349	12.9		-22	20.2		336	59.9		-19	44.1		325	27.1		-16	15.7		314	32.4		-12	8.7		304	8.9		-7	35.9		294	7.1		-2	49.1	
40	354	2.5		-22	18.5		341	50.0		-19	41.5		330	17.8		-16	12.5		319	23.5		-12	5.0		309	0.4		-7	32.0		298	58.8		-2	45.0	
10 0	358	52.0	289.6	-22	16.7	1.8	346	40.1	290.1	-19	39.0	2.6	335	8.4	290.7	-16	9.3	3.2	324	14.7	291.2	-12	1.4	3.7	313	51.9	291.5	-7	28.0	3.9	303	50.6	291.7	-2	41.0	4.0
20	3	41.6		-22	15.0		351	30.2		-19	36.4		339	59.1		-16	6.1		329	5.8		-11	57.7		318	43.4		-7	24.1		308	42.3		-2	37.0	
40	8	31.2		-22	13.2		356	20.4		-19	33.8		344	49.8		-16	2.9		333	57.0		-11	54.1		323	35.0		-7	20.2		313	34.0		-2	32.9	
11 0	13	20.8	289.6	-22	11.4	1.8	1	10.5	290.1	-19	31.2	2.6	349	40.5	290.7	-15	59.7	3.3	338	48.2	291.2	-11	50.4	3.7	328	26.5	291.5	-7	16.3	3.9	318	25.8	291.8	-2	28.9	4.0
20	18	10.4		-22	9.6		6	0.6		-19	28.6		354	31.2		-15	56.4		343	39.3		-11	46.7		333	18.0		-7	12.3		323	17.6		-2	24.9	
40	22	60.0		-22	7.7		10	50.8		-19	25.9		359	21.9		-15	53.2		348	30.5		-11	43.1		338	9.6		-7	8.4		328	9.3		-2	20.8	
12 0	27	49.6	289.6	-22	5.9	1.9	15	40.9	290.2	-19	23.3	2.7	4	12.6	290.7	-15	49.9	3.3	353	21.7	291.2	-11	39.4	3.7	343	1.1	291.6	-7	4.5	3.9	333	1.1	291.8	-2	16.8	4.0
20	32	39.2		-22	4.0		20	31.1		-19	20.6		9	3.3		-15	46.7		358	12.9		-11	35.7		347	52.7		-7	0.6		337	52.8		-2	12.8	
40	37	28.8		-22	2.2		25	21.3		-19	18.0		13	54.0		-15	43.4		3	4.1		-11	32.0		352	44.2		-6	56.6		342	44.6		-2	8.7	
13 0	42	18.4	289.6	-22	0.3	1.9	30	11.5	290.2	-19	15.3	2.7	18	44.8	290.7	-15	40.1	3.3	7	55.3	291.2	-11	28.3	3.7	357	35.8	291.6	-6	52.7	3.9	347	36.4	291.8	-2	4.7	4.0
20	47	8.1		-21	58.4		35	1.6		-19	12.6		23	35.5		-15	36.9		12	46.5		-11	24.6		2	27.3		-6	48.7		352	28.1		-2	0.7	
40	51	57.7		-21	56.5		39	51.8		-19	10.0		28	26.2		-15	33.6		17	37.7		-11	20.9		7	18.9		-6	44.8		357	19.9		-1	56.6	
14 0	56	47.3	289.7	-21	54.6	1.9	44	42.0	290.2	-19	7.3	2.7	33	17.0	290.8	-15	30.3	3.3	22	29.0	291.2	-11	17.2	3.7	12	10.5	291.6	-6	40.9	4.0	2	11.7	291.8	-1	52.6	4.0
20	61	37.0		-21	52.7		49	32.3		-19	4.6		38	7.8		-15	27.0		27	20.2		-11	13.5		17	2.0		-6	36.9		7	3.4		-1	48.5	
40	66	26.7		-21	50.7		54	22.5		-19	1.8		42	58.5		-15	23.7		32	11.4		-11	9.8		21	53.6		-6	33.0		11	55.2		-1	44.5	
15 0	71	16.3	289.7	-21	48.8	2.0	59	12.7	290.2	-18	59.1	2.7	47	49.3	290.8	-15	20.4	3.3	37	2.7	291.3	-11	6.1	3.7	26	45.2	291.6	-6	29.0	4.0	16	47.0	291.8	-1	40.5	4.1
20	76	6.0		-21	46.8		64	2.9		-18	56.4		52	40.1		-15	17.1		41	53.9		-11	2.4		31	36.8		-6	25.1		21	38.7		-1	36.4	
40	80	55.7		-21	44.9		68	53.2		-18	53.6		57	30.9		-15	13.7		46	45.2		-10	58.7		36	28.4		-6	21.1		26	30.5		-1	32.4	
16 0	85	45.4	289.7	-21	42.9	2.0	73	43.4	290.3	-18	50.9	2.8	62	21.7	290.8	-15	10.4	3.3	51	36.4	291.3	-10	54.9	3.7	41	20.0	291.6	-6	17.1	3.9	31	22.3	291.8	-1	28.3	4.0
20	90	35.1		-21	40.9		78	33.7		-18	48.1		67	12.5		-15	7.1		56	27.7		-10	51.2		46	11.6		-6	13.2		36	14.1		-1	24.3	
40	95	24.8		-21	38.9		83	24.0		-18	45.4		72	3.3		-15	3.7		61	18.9		-10	47.5		51	3.2		-6	9.2		41	5.8		-1	20.3	
17 0	100	14.5	289.7	-21	36.9	2.1	88	14.2	290.3	-18	42.6	2.8	76	54.1	290.8	-15	0.4	3.4	66	10.2	291.3	-10	43.7	3.7	55	54.8	291.6	-6	5.3	4.0	45	57.6	291.8	-1	16.2	4.0
20	105	4.2		-21	34.8		93	4.5		-18	39.8		81	44.9		-14	57.0		71	1.5		-10	40.0		60	46.4		-6	1.3		50	49.4		-1	12.2	
40	109	54.0		-21	32.8		97	54.8		-18	37.0		86	35.7		-14	53.6		75	52.8		-10	36.2		65	38.0		-5	57.3		55	41.2		-1	8.1	
18 0	114	43.7	289.8	-21	30.7	2.1	102	45.1	290.3	-18	34.2	2.8	91	26.6	290.9	-14	50.3	3.4	80	44.1	291.3	-10	32.5	3.8	70	29.6	291.6	-5	53.3	4.0	60	33.0	291.8	-1	4.1	4.0
20	119	33.4		-21	28.7		107	35.4		-18	31.4		96	17.4		-14	46.9		85	35.4		-10	28.7		75	21.2		-5	49.4		65	24.8		-1	0.1	
40	124	23.2		-21	26.6		112	25.7		-18	28.5		101	8.3		-14	43.5		90	26.7		-10	24.9		80	12.8		-5	45.4		70	16.6		-0	56.0	
19 0	129	13.0	289.8	-21	24.5	2.1	117	16.0	290.3	-18	25.7	2.9	105	59.1	290.9	-14	40.1	3.4	95	18.0	291.3	-10	21.2	3.8	85	4.5	291.6	-5	41.4	4.0	75	8.3	291.8	-0	52.0	4.0
20	134	2.7		-21	22.4		122	6.4		-18	22.9		110	50.0		-14	36.7		100	9.3		-10	17.4		89	56.1		-5	37.4		80	0.1		-0	47.9	
40	138	52.5		-21	20.3		126	56.7		-18	20.0		115	40.9		-14	33.3		105	0.6		-10	13.6		94	47.7		-5	33.5		84	51.9		-0	43.9	
20 0	143	42.3	289.8	-21	18.2	2.2	131	47.0	290.4	-18	17.1	2.9	120	31.7	290.9	-14	29.9	3.4	109	51.9	291.3	-10	9.9	3.8	99	39.3	291.6	-5	29.5	4.0	89	43.7	291.8	-0	39.9	4.1
20	148	32.1		-21	16.0		136	37.4		-18	14.3		125	22.6		-14	26.5		114	43.2		-10	6.1		104	31.0		-5	25.5		94	35.5		-0	35.8	
40	153	21.9		-21	13.9		141	27.8		-18	11.4		130	13.5		-14	23.1		119	34.6		-10	2.3		109	22.6		-5	21.5		99	27.3		-0	31.8	
21 0	158	11.7	289.8	-21	11.7	2.2	146	18.1	290.4	-18	8.5	2.9	135	4.4	290.9	-14	19.6	3.4	124	25.9	291.3	-9	58.5	3.8	114	14.3	291.6	-5	17.5	4.0	104	19.1	291.8	-0	27.7	4.0
20	163	1.5		-21	9.5		151	8.5		-18	5.6		139	55.3		-14	16.2		129	17.3		-9	54.7		119	5.9		-5	13.5		109	10.9		-0	23.7	
40	167	51.3		-21	7.4		155	58.9		-18	2.7		144	46.2		-14	12.7		134	8.6		-9	50.9		123	57.6		-5	9.5		114	2.7		-0	19.7	
22 0	172	41.1	289.8	-21	5.2	2.2	160	49.3	290.4	-17	59.8	2.9	149	37.2	290.9	-14	9.3	3.5	138	60.0	291.4	-9	47.1	3.8	128	49.2	291.7	-5	5.6	4.0	118	54.5	291.8	-0	15.6	4.0
20	177	31.0		-21	3.0		165	39.7		-17	56.9		154	28.1		-14	5.8		143	51.3		-9	43.3		133	40.9		-5	1.6		123	46.3		-0	11.6	
40	182	20.8		-21	0.8		170	30.1		-17	53.9		159	19.0		-14	2.4		148	42.7		-9	39.5		138	32.5		-4	57.6		128	38.1		-0	7.6	
23 0	187	10.7	289.9	-20	58.5	2.2	175	20.5	290.4	-17	51.0	3.0	164	10.0	291.0	-13	58.9	3.5	153	34.1	291.4	-9	35.7	3.8	143	24.2	291.7	-4	53.6	4.0	133	29.9	291.8	-0	3.5	4.0
20	192	0.5		-20	56.3		180	10.9		-17	48.0		169	0.9		-13	55.4		158	25.4		-9	31.9		148	15.9		-4	49.6		138	21.7		0	0.5	
40	196	50.4		-20	54.0		185	1.3		-17	45.1		173	51.9		-13	52.0		163	16.8		-9	28.0		153	7.5		-4	45.6		143	13.5		0	4.6	

2011 Moon

h m	6 Feb GHA ° ′	d	Dec ° ′	d′	7 Feb GHA ° ′	d	Dec ° ′	d′	8 Feb GHA ° ′	d	Dec ° ′	d′	9 Feb GHA ° ′	d	Dec ° ′	d′	10 Feb GHA ° ′	d	Dec ° ′	d′	11 Feb GHA ° ′	d	Dec ° ′	d′
0 0	148 5.3	291.8	0 8.6	4.0	138 15.1	291.8	4 56.5	3.9	128 17.0	291.6	9 33.1	3.7	117 59.3	291.2	13 49.4	3.4	107 11.3	290.7	17 35.5	2.9	95 44.4	290.1	20 40.7	2.2
20	152 57.1		0 12.6		143 6.9		5 0.5		133 8.6		9 36.9		122 50.5		13 52.7		112 2.1		17 38.4		100 34.6		20 42.9	
40	157 48.9		0 16.7		147 58.7		5 4.4		138 0.1		9 40.6		127 41.7		13 56.1		116 52.8		17 41.3		105 24.7		20 45.1	
1 0	162 40.7	291.8	0 20.7	4.0	152 50.5	291.8	5 8.3	3.9	142 51.7	291.6	9 44.3	3.7	132 32.9	291.2	13 59.5	3.3	121 43.5	290.7	17 44.1	2.9	110 14.8	290.1	20 47.3	2.2
20	167 32.5		0 24.7		157 42.2		5 12.3		147 43.3		9 48.0		137 24.2		14 2.8		126 34.2		17 47.0		115 5.0		20 49.5	
40	172 24.3		0 28.8		162 34.0		5 16.2		152 34.8		9 51.7		142 15.4		14 6.2		131 24.9		17 49.8		119 55.1		20 51.7	
2 0	177 16.2	291.8	0 32.8	4.0	167 25.8	291.8	5 20.1	3.9	157 26.4	291.6	9 55.4	3.7	147 6.6	291.2	14 9.5	3.3	136 15.7	290.7	17 52.7	2.8	124 45.2	290.1	20 53.9	2.1
20	182 8.0		0 36.8		172 17.5		5 24.1		162 18.0		9 59.1		151 57.8		14 12.8		141 6.3		17 55.5		129 35.3		20 56.0	
40	186 59.8		0 40.9		177 9.3		5 28.0		167 9.5		10 2.8		156 49.0		14 16.2		145 57.0		17 58.3		134 25.4		20 58.2	
3 0	191 51.6	291.8	0 44.9	4.0	182 1.1	291.8	5 31.9	3.9	172 1.1	291.5	10 6.5	3.7	161 40.1	291.2	14 19.5	3.3	150 47.7	290.7	18 1.1	2.8	139 15.5	290.1	21 0.3	2.1
20	196 43.4		0 48.9		186 52.8		5 35.8		176 52.6		10 10.2		166 31.3		14 22.8		155 38.4		18 3.9		144 5.6		21 2.5	
40	201 35.2		0 53.0		191 44.6		5 39.7		181 44.2		10 13.8		171 22.5		14 26.1		160 29.1		18 6.7		148 55.6		21 4.6	
4 0	206 27.0	291.8	0 57.0	4.0	196 36.3	291.8	5 43.7	3.9	186 35.7	291.5	10 17.5	3.7	176 13.6	291.2	14 29.4	3.3	165 19.7	290.6	18 9.5	2.8	153 45.7	290.0	21 6.7	2.1
20	211 18.8		1 1.0		201 28.1		5 47.6		191 27.2		10 21.2		181 4.8		14 32.7		170 10.4		18 12.3		158 35.8		21 8.8	
40	216 10.6		1 5.0		206 19.8		5 51.5		196 18.8		10 24.9		185 56.0		14 36.0		175 1.0		18 15.1		163 25.8		21 10.9	
5 0	221 2.4	291.8	1 9.1	4.0	211 11.6	291.7	5 55.4	3.9	201 10.3	291.5	10 28.5	3.7	190 47.1	291.1	14 39.3	3.3	179 51.6	290.6	18 17.8	2.8	168 15.8	290.0	21 13.0	2.1
20	225 54.3		1 13.1		216 3.3		5 59.3		206 1.8		10 32.2		195 38.2		14 42.6		184 42.3		18 20.6		173 5.9		21 15.0	
40	230 46.1		1 17.1		220 55.1		6 3.2		210 53.3		10 35.8		200 29.4		14 45.9		189 32.9		18 23.4		177 55.9		21 17.1	
6 0	235 37.9	291.8	1 21.1	4.0	225 46.8	291.7	6 7.1	3.9	215 44.8	291.5	10 39.5	3.6	205 20.5	291.1	14 49.1	3.3	194 23.5	290.6	18 26.1	2.7	182 45.9	290.0	21 19.2	2.0
20	240 29.7		1 25.2		230 38.6		6 11.0		220 36.3		10 43.1		210 11.6		14 52.4		199 14.1		18 28.8		187 35.9		21 21.2	
40	245 21.5		1 29.2		235 30.3		6 14.9		225 27.8		10 46.8		215 2.7		14 55.7		204 4.7		18 31.5		192 25.9		21 23.2	
7 0	250 13.3	291.8	1 33.2	4.0	240 22.0	291.7	6 18.8	3.9	230 19.3	291.5	10 50.4	3.6	219 53.8	291.1	14 58.9	3.2	208 55.3	290.6	18 34.3	2.7	197 15.9	290.0	21 25.2	2.0
20	255 5.1		1 37.2		245 13.8		6 22.7		235 10.8		10 54.0		224 44.9		15 2.1		213 45.9		18 37.0		202 5.9		21 27.2	
40	259 56.9		1 41.3		250 5.5		6 26.5		240 2.3		10 57.7		229 36.0		15 5.4		218 36.4		18 39.7		206 55.8		21 29.2	
8 0	264 48.8	291.8	1 45.3	4.0	254 57.2	291.7	6 30.4	3.9	244 53.8	291.5	11 1.3	3.6	234 27.1	291.1	15 8.6	3.2	223 27.0	290.5	18 42.4	2.7	211 45.8	289.9	21 31.2	2.0
20	269 40.6		1 49.3		259 48.9		6 34.3		249 45.3		11 4.9		239 18.2		15 11.8		228 17.6		18 45.0		216 35.7		21 33.2	
40	274 32.4		1 53.3		264 40.7		6 38.2		254 36.8		11 8.5		244 9.3		15 15.0		233 8.1		18 47.7		221 25.7		21 35.1	
9 0	279 24.2	291.8	1 57.3	4.0	269 32.4	291.7	6 42.1	3.9	259 28.2	291.5	11 12.1	3.6	249 0.4	291.1	15 18.3	3.2	237 58.6	290.5	18 50.4	2.6	226 15.6	289.9	21 37.1	1.9
20	284 16.0		2 1.3		274 24.1		6 45.9		264 19.7		11 15.7		253 51.4		15 21.5		242 49.2		18 53.0		231 5.5		21 39.0	
40	289 7.8		2 5.4		279 15.8		6 49.8		269 11.2		11 19.3		258 42.5		15 24.7		247 39.7		18 55.7		235 55.5		21 41.0	
10 0	293 59.6	291.8	2 9.4	4.0	284 7.6	291.7	6 53.7	3.9	274 2.6	291.4	11 22.9	3.6	263 33.5	291.0	15 27.8	3.2	252 30.2	290.5	18 58.3	2.6	240 45.4	289.9	21 42.9	1.9
20	298 51.4		2 13.4		288 59.3		6 57.5		278 54.1		11 26.5		268 24.6		15 31.0		257 20.7		19 0.9		245 35.3		21 44.8	
40	303 43.3		2 17.4		293 51.0		7 1.4		283 45.5		11 30.1		273 15.6		15 34.2		262 11.2		19 3.6		250 25.1		21 46.7	
11 0	308 35.1	291.8	2 21.4	4.0	298 42.7	291.7	7 5.3	3.8	288 37.0	291.4	11 33.7	3.6	278 6.6	291.0	15 37.4	3.2	267 1.7	290.5	19 6.2	2.6	255 15.0	289.9	21 48.6	1.8
20	313 26.9		2 25.4		303 34.4		7 9.1		293 28.4		11 37.3		282 57.7		15 40.5		271 52.2		19 8.8		260 4.9		21 50.4	
40	318 18.7		2 29.4		308 26.1		7 13.0		298 19.8		11 40.8		287 48.7		15 43.7		276 42.7		19 11.4		264 54.8		21 52.3	
12 0	323 10.5	291.8	2 33.4	4.0	313 17.8	291.7	7 16.8	3.8	303 11.3	291.4	11 44.4	3.6	292 39.7	291.0	15 46.9	3.1	281 33.1	290.5	19 13.9	2.6	269 44.6	289.8	21 54.1	1.8
20	328 2.3		2 37.4		318 9.5		7 20.7		308 2.7		11 48.0		297 30.7		15 50.0		286 23.6		19 16.5		274 34.5		21 56.0	
40	332 54.1		2 41.4		323 1.2		7 24.5		312 54.1		11 51.5		302 21.7		15 53.1		291 14.0		19 19.1		279 24.3		21 57.8	
13 0	337 45.9	291.8	2 45.4	4.0	327 52.9	291.7	7 28.3	3.8	317 45.5	291.4	11 55.1	3.5	307 12.7	291.0	15 56.3	3.1	296 4.5	290.4	19 21.6	2.5	284 14.1	289.8	21 59.6	1.8
20	342 37.7		2 49.4		332 44.6		7 32.2		322 36.9		11 58.6		312 3.7		15 59.4		300 54.9		19 24.2		289 4.0		22 1.4	
40	347 29.5		2 53.4		337 36.3		7 36.0		327 28.3		12 2.2		316 54.6		16 2.5		305 45.4		19 26.7		293 53.8		22 3.2	
14 0	352 21.3	291.8	2 57.4	4.0	342 27.9	291.7	7 39.8	3.8	332 19.7	291.4	12 5.7	3.5	321 45.6	291.0	16 5.6	3.1	310 35.8	290.4	19 29.2	2.5	298 43.6	289.8	22 5.0	1.7
20	357 13.2		3 1.4		347 19.6		7 43.7		337 11.1		12 9.2		326 36.6		16 8.7		315 26.2		19 31.8		303 33.4		22 6.7	
40	2 5.0		3 5.4		352 11.3		7 47.5		342 2.5		12 12.8		331 27.5		16 11.8		320 16.6		19 34.3		308 23.2		22 8.5	
15 0	6 56.8	291.8	3 9.4	4.0	357 3.0	291.7	7 51.3	3.8	346 53.9	291.4	12 16.3	3.5	336 18.5	290.9	16 14.9	3.1	325 7.0	290.4	19 36.8	2.5	313 12.9	289.8	22 10.2	1.7
20	11 48.6		3 13.4		1 54.6		7 55.1		351 45.3		12 19.8		341 9.4		16 18.0		329 57.4		19 39.3		318 2.7		22 12.0	
40	16 40.4		3 17.4		6 46.3		7 58.9		356 36.7		12 23.3		346 0.3		16 21.1		334 47.7		19 41.8		322 52.5		22 13.7	
16 0	21 32.2	291.8	3 21.4	4.0	11 38.0	291.7	8 2.7	3.8	1 28.0	291.4	12 26.8	3.5	350 51.3	290.9	16 24.1	3.1	339 38.1	290.4	19 44.2	2.5	327 42.2	289.7	22 15.4	1.7
20	26 24.0		3 25.4		16 29.6		8 6.6		6 19.4		12 30.3		355 42.2		16 27.2		344 28.5		19 46.7		332 32.0		22 17.1	
40	31 15.8		3 29.3		21 21.3		8 10.4		11 10.8		12 33.8		0 33.1		16 30.2		349 18.8		19 49.1		337 21.7		22 18.8	
17 0	36 7.6	291.8	3 33.3	4.0	26 13.0	291.7	8 14.2	3.8	16 2.1	291.3	12 37.3	3.5	5 24.0	290.9	16 33.3	3.0	354 9.2	290.3	19 51.6	2.4	342 11.4	289.7	22 20.4	1.7
20	40 59.4		3 37.3		31 4.6		8 18.0		20 53.5		12 40.8		10 14.9		16 36.3		358 59.5		19 54.0		347 1.1		22 22.1	
40	45 51.2		3 41.3		35 56.3		8 21.8		25 44.8		12 44.3		15 5.8		16 39.3		3 49.8		19 56.4		351 50.8		22 23.8	
18 0	50 43.0	291.8	3 45.3	4.0	40 47.9	291.6	8 25.5	3.8	30 36.1	291.3	12 47.7	3.5	19 56.7	290.9	16 42.4	3.0	8 40.1	290.3	19 58.9	2.4	356 40.6	289.7	22 25.4	1.6
20	55 34.8		3 49.2		45 39.6		8 29.3		35 27.5		12 51.2		24 47.5		16 45.4		13 30.4		20 1.3		1 30.2		22 27.0	
40	60 26.6		3 53.2		50 31.2		8 33.1		40 18.8		12 54.7		29 38.4		16 48.4		18 20.7		20 3.7		6 19.9		22 28.6	
19 0	65 18.4	291.8	3 57.2	4.0	55 22.8	291.6	8 36.9	3.8	45 10.1	291.3	12 58.1	3.5	34 29.3	290.8	16 51.4	3.0	23 11.0	290.3	20 6.0	2.4	11 9.6	289.7	22 30.2	1.6
20	70 10.2		4 1.1		60 14.5		8 40.7		50 1.4		13 1.6		39 20.1		16 54.4		28 1.3		20 8.4		15 59.3		22 31.8	
40	75 2.0		4 5.1		65 6.1		8 44.4		54 52.7		13 5.0		44 11.0		16 57.4		32 51.6		20 10.8		20 48.9		22 33.4	
20 0	79 53.7	291.8	4 9.1	4.0	69 57.7	291.6	8 48.2	3.8	59 44.1	291.3	13 8.5	3.4	49 1.8	290.8	17 0.4	2.9	37 41.9	290.3	20 13.2	2.3	25 38.6	289.6	22 34.9	1.6
20	84 45.5		4 13.0		74 49.3		8 52.0		64 35.4		13 11.9		53 52.6		17 3.3		42 32.1		20 15.5		30 28.2		22 36.5	
40	89 37.3		4 17.0		79 41.0		8 55.7		69 26.6		13 15.4		58 43.5		17 6.3		47 22.4		20 17.8		35 17.9		22 38.0	
21 0	94 29.1	291.8	4 21.0	3.9	84 32.6	291.6	8 59.5	3.7	74 17.9	291.3	13 18.8	3.4	63 34.3	290.8	17 9.2	3.0	52 12.6	290.2	20 20.2	2.3	40 7.5	289.6	22 39.6	1.5
20	99 20.9		4 24.9		89 24.2		9 3.2		79 9.2		13 22.2		68 25.1		17 12.2		57 2.8		20 22.5		44 57.1		22 41.1	
40	104 12.7		4 28.9		94 15.8		9 7.0		84 0.5		13 25.6		73 15.9		17 15.1		61 53.1		20 24.8		49 46.7		22 42.6	
22 0	109 4.5	291.8	4 32.8	4.0	99 7.4	291.6	9 10.7	3.8	88 51.8	291.3	13 29.0	3.4	78 6.7	290.8	17 18.1	2.9	66 43.3	290.2	20 27.1	2.3	54 36.3	289.6	22 44.1	1.5
20	113 56.3		4 36.8		103 59.0		9 14.5		93 43.0		13 32.4		82 57.5		17 21.0		71 33.5		20 29.4		59 25.9		22 45.5	
40	118 48.0		4 40.7		108 50.6		9 18.2		98 34.3		13 35.8		87 48.3		17 23.9		76 23.7		20 31.7		64 15.5		22 47.0	
23 0	123 39.8	291.8	4 44.7	3.9	113 42.2	291.6	9 22.0	3.7	103 25.5	291.2	13 39.2	3.4	92 39.0	290.8	17 26.8	2.9	81 13.9	290.2	20 33.9	2.3	69 5.1	289.6	22 48.5	1.4
20	128 31.6		4 48.6		118 33.8		9 25.7		108 16.8		13 42.6		97 29.8		17 29.7		86 4.1		20 36.2		73 54.6		22 49.9	
40	133 23.4		4 52.6		123 25.4		9 29.4		113 8.0		13 46.0		102 20.6		17 32.6		90 54.2		20 38.4		78 44.2		22 51.3	

2011 Moon

	12 Feb					13 Feb					14 Feb					15 Feb					16 Feb					17 Feb				
	GHA			Dec		GHA			Dec		GHA			Dec		GHA			Dec		GHA			Dec		GHA			Dec	
h m	o	'	d	o	'	o	'	d	o	'	o	'	d	o	'	o	'	d	o	'	o	'	d	o	'	o	'	d	o	'
0 0	83	33.7	289.5	22	52.7	70	40.5	289.0	23	59.1	57	13.5	288.6	23	48.6	43	27.4	288.5	22	14.0	29	39.3	288.6	19	15.1	16	2.7	288.8	14	59.6
20	88	23.3		22	54.1	75	29.5		23	59.5	62	2.1		23	47.9	48	15.9		22	12.1	34	27.9		19	12.0	20	51.5		14	55.6
40	93	12.8		22	55.5	80	18.5		23	59.9	66	50.7		23	47.1	53	4.4		22	10.2	39	16.4		19	9.0	25	40.3		14	51.6
1 0	98	2.3	289.5	22	56.9	85	7.5	289.0	24	0.3	71	39.3	288.6	23	46.4	57	52.8	288.5	22	8.2	44	5.0	288.6	19	5.9	30	29.1	288.8	14	47.5
20	102	51.8		22	58.3	89	56.5		24	0.6	76	27.9		23	45.6	62	41.3		22	6.3	48	53.6		19	2.8	35	17.9		14	43.5
40	107	41.3		22	59.6	94	45.4		24	1.0	81	16.5		23	44.8	67	29.8		22	4.3	53	42.1		18	59.7	40	6.6		14	39.4
2 0	112	30.8	289.5	23	0.9	99	34.4	288.9	24	1.3	86	5.1	288.6	23	44.0	72	18.3	288.5	22	2.3	58	30.7	288.6	18	56.5	44	55.4	288.8	14	35.3
20	117	20.3		23	2.3	104	23.4		24	1.6	90	53.7		23	43.2	77	6.7		22	0.3	63	19.3		18	53.4	49	44.2		14	31.2
40	122	9.8		23	3.6	109	12.3		24	1.9	95	42.3		23	42.3	81	55.2		21	58.3	68	7.8		18	50.2	54	33.0		14	27.1
3 0	126	59.3	289.5	23	4.9	114	1.3	288.9	24	2.2	100	30.9	288.6	23	41.5	86	43.7	288.5	21	56.2	72	56.4	288.6	18	47.1	59	21.9	288.8	14	23.0
20	131	48.8		23	6.2	118	50.2		24	2.5	105	19.5		23	40.6	91	32.2		21	54.1	77	45.0		18	43.9	64	10.7		14	18.9
40	136	38.2		23	7.4	123	39.1		24	2.7	110	8.1		23	39.7	96	20.6		21	52.1	82	33.6		18	40.7	68	59.5		14	14.7
4 0	141	27.7	289.4	23	8.7	128	28.0	288.9	24	3.0	114	56.7	288.6	23	38.8	101	9.1	288.5	21	50.0	87	22.2	288.6	18	37.5	73	48.3	288.8	14	10.6
20	146	17.1		23	9.9	133	17.0		24	3.2	119	45.2		23	37.9	105	57.6		21	47.9	92	10.7		18	34.3	78	37.1		14	6.4
40	151	6.5		23	11.2	138	5.9		24	3.4	124	33.8		23	36.9	110	46.1		21	45.7	96	59.3		18	31.0	83	25.9		14	2.3
5 0	155	56.0	289.4	23	12.4	142	54.8	288.9	24	3.6	129	22.4	288.6	23	36.0	115	34.5	288.5	21	43.6	101	47.9	288.6	18	27.8	88	14.8	288.8	13	58.1
20	160	45.4		23	13.6	147	43.7		24	3.8	134	11.0		23	35.0	120	23.0		21	41.4	106	36.5		18	24.5	93	3.6		13	53.9
40	165	34.8		23	14.8	152	32.6		24	3.9	138	59.5		23	34.0	125	11.5		21	39.2	111	25.1		18	21.2	97	52.4		13	49.7
6 0	170	24.2	289.4	23	16.0	157	21.5	288.9	24	4.1	143	48.1	288.6	23	33.0	129	60.0	288.5	21	37.0	116	13.7	288.6	18	17.9	102	41.3	288.8	13	45.5
20	175	13.6		23	17.1	162	10.3		24	4.2	148	36.6		23	32.0	134	48.4		21	34.8	121	2.3		18	14.6	107	30.1		13	41.3
40	180	3.0		23	18.3	166	59.2		24	4.3	153	25.2		23	30.9	139	36.9		21	32.6	125	50.9		18	11.3	112	19.0		13	37.0
7 0	184	52.4	289.4	23	19.4	171	48.1	288.9	24	4.4	158	13.7	288.5	23	29.9	144	25.4	288.5	21	30.4	130	39.5	288.6	18	7.9	117	7.8	288.9	13	32.8
20	189	41.7		23	20.6	176	36.9		24	4.5	163	2.3		23	28.8	149	13.9		21	28.1	135	28.1		18	4.6	121	56.7		13	28.5
40	194	31.1		23	21.7	181	25.8		24	4.6	167	50.8		23	27.7	154	2.4		21	25.8	140	16.8		18	1.2	126	45.5		13	24.2
8 0	199	20.4	289.3	23	22.8	186	14.6	288.8	24	4.6	172	39.4	288.5	23	26.6	158	50.8	288.5	21	23.5	145	5.4	288.6	17	57.8	131	34.4	288.9	13	20.0
20	204	9.8		23	23.9	191	3.5		24	4.7	177	27.9		23	25.5	163	39.3		21	21.2	149	54.0		17	54.4	136	23.3		13	15.7
40	208	59.1		23	24.9	195	52.3		24	4.7	182	16.5		23	24.3	168	27.8		21	18.9	154	42.6		17	51.0	141	12.1		13	11.4
9 0	213	48.5	289.3	23	26.0	200	41.2	288.8	24	4.7	187	5.0	288.5	23	23.2	173	16.3	288.5	21	16.6	159	31.2	288.6	17	47.6	146	1.0	288.9	13	7.1
20	218	37.8		23	27.0	205	30.0		24	4.7	191	53.5		23	22.0	178	4.8		21	14.2	164	19.9		17	44.1	150	49.9		13	2.8
40	223	27.1		23	28.1	210	18.8		24	4.7	196	42.1		23	20.8	182	53.2		21	11.9	169	8.5		17	40.7	155	38.8		12	58.4
10 0	228	16.4	289.3	23	29.1	215	7.6	288.8	24	4.6	201	30.6	288.5	23	19.6	187	41.7	288.5	21	9.5	173	57.1	288.6	17	37.2	160	27.6	288.9	12	54.1
20	233	5.7		23	30.1	219	56.4		24	4.6	206	19.1		23	18.4	192	30.2		21	7.1	178	45.8		17	33.7	165	16.5		12	49.7
40	237	55.0		23	31.1	224	45.3		24	4.5	211	7.7		23	17.2	197	18.7		21	4.6	183	34.4		17	30.2	170	5.4		12	45.4
11 0	242	44.3	289.3	23	32.1	229	34.1	288.8	24	4.4	215	56.2	288.5	23	15.9	202	7.2	288.5	21	2.2	188	23.1	288.6	17	26.7	174	54.3	288.9	12	41.0
20	247	33.6		23	33.0	234	22.8		24	4.3	220	44.7		23	14.6	206	55.7		20	59.8	193	11.7		17	23.2	179	43.2		12	36.6
40	252	22.8		23	34.0	239	11.6		24	4.2	225	33.2		23	13.3	211	44.2		20	57.3	198	0.3		17	19.6	184	32.1		12	32.2
12 0	257	12.1	289.2	23	34.9	244	0.4	288.8	24	4.1	230	21.8	288.5	23	12.0	216	32.6	288.5	20	54.8	202	49.0	288.7	17	16.1	189	21.0	288.9	12	27.8
20	262	1.3		23	35.8	248	49.2		24	3.9	235	10.3		23	10.7	221	21.1		20	52.3	207	37.7		17	12.5	194	9.9		12	23.4
40	266	50.6		23	36.7	253	38.0		24	3.7	239	58.8		23	9.4	226	9.6		20	49.8	212	26.3		17	9.0	198	58.8		12	19.0
13 0	271	39.8	289.2	23	37.6	258	26.7	288.8	24	3.6	244	47.3	288.5	23	8.0	230	58.1	288.5	20	47.3	217	15.0	288.7	17	5.4	203	47.8	288.9	12	14.6
20	276	29.0		23	38.5	263	15.5		24	3.4	249	35.8		23	6.6	235	46.6		20	44.7	222	3.6		17	1.8	208	36.7		12	10.1
40	281	18.3		23	39.4	268	4.3		24	3.1	254	24.3		23	5.3	240	35.1		20	42.2	226	52.3		16	58.1	213	25.6		12	5.7
14 0	286	7.5	289.2	23	40.2	272	53.0	288.7	24	2.9	259	12.8	288.5	23	3.9	245	23.6	288.5	20	39.6	231	41.0	288.7	16	54.5	218	14.5	288.9	12	1.2
20	290	56.7		23	41.1	277	41.8		24	2.7	264	1.3		23	2.4	250	12.1		20	37.0	236	29.7		16	50.9	223	3.4		11	56.8
40	295	45.9		23	41.9	282	30.5		24	2.4	268	49.8		23	1.0	255	0.6		20	34.4	241	18.3		16	47.2	227	52.4		11	52.3
15 0	300	35.1	289.2	23	42.7	287	19.3	288.7	24	2.1	273	38.3	288.5	22	59.5	259	49.1	288.5	20	31.8	246	7.0	288.7	16	43.5	232	41.3	288.9	11	47.8
20	305	24.3		23	43.5	292	8.0		24	1.8	278	26.8		22	58.1	264	37.6		20	29.1	250	55.7		16	39.8	237	30.3		11	43.3
40	310	13.4		23	44.3	296	56.7		24	1.5	283	15.3		22	56.6	269	26.1		20	26.5	255	44.4		16	36.2	242	19.2		11	38.8
16 0	315	2.6	289.2	23	45.0	301	45.4	288.7	24	1.2	288	3.8	288.5	22	55.1	274	14.6	288.5	20	23.8	260	33.1	288.7	16	32.4	247	8.2	289.0	11	34.3
20	319	51.8		23	45.8	306	34.2		24	0.9	292	52.3		22	53.6	279	3.1		20	21.1	265	21.8		16	28.7	251	57.1		11	29.8
40	324	40.9		23	46.5	311	22.9		24	0.5	297	40.8		22	52.0	283	51.6		20	18.4	270	10.5		16	25.0	256	46.1		11	25.2
17 0	329	30.1	289.1	23	47.3	316	11.6	288.7	24	0.1	302	29.3	288.5	22	50.5	288	40.2	288.5	20	15.7	274	59.2	288.7	16	21.2	261	35.0	289.0	11	20.7
20	334	19.2		23	48.0	321	0.3		23	59.8	307	17.8		22	48.9	293	28.7		20	13.0	279	47.9		16	17.5	266	24.0		11	16.1
40	339	8.4		23	48.7	325	49.0		23	59.4	312	6.3		22	47.3	298	17.2		20	10.2	284	36.6		16	13.7	271	12.9		11	11.6
18 0	343	57.5	289.1	23	49.3	330	37.7	288.7	23	58.9	316	54.8	288.5	22	45.7	303	5.7	288.5	20	7.4	289	25.3	288.7	16	9.9	276	1.9	289.0	11	7.0
20	348	46.6		23	50.0	335	26.4		23	58.5	321	43.3		22	44.1	307	54.2		20	4.7	294	14.0		16	6.1	280	50.9		11	2.4
40	353	35.7		23	50.7	340	15.1		23	58.0	326	31.8		22	42.5	312	42.7		20	1.9	299	2.7		16	2.3	285	39.9		10	57.8
19 0	358	24.8	289.1	23	51.3	345	3.7	288.7	23	57.6	331	20.2	288.5	22	40.8	317	31.3	288.5	19	59.1	303	51.5	288.7	15	58.5	290	28.8	289.0	10	53.2
20	3	13.9		23	51.9	349	52.4		23	57.1	336	8.7		22	39.1	322	19.8		19	56.2	308	40.2		15	54.6	295	17.8		10	48.6
40	8	3.0		23	52.5	354	41.1		23	56.6	340	57.2		22	37.5	327	8.3		19	53.4	313	28.9		15	50.8	300	6.8		10	44.0
20 0	12	52.1	289.1	23	53.1	359	29.8	288.7	23	56.1	345	45.7	288.5	22	35.7	331	56.8	288.5	19	50.5	318	17.7	288.7	15	46.9	304	55.8	289.0	10	39.4
20	17	41.2		23	53.7	4	18.4		23	55.5	350	34.2		22	34.0	336	45.4		19	47.7	323	6.4		15	43.0	309	44.8		10	34.8
40	22	30.2		23	54.3	9	7.1		23	55.0	355	22.7		22	32.3	341	33.9		19	44.8	327	55.1		15	39.2	314	33.8		10	30.1
21 0	27	19.3	289.0	23	54.8	13	55.7	288.6	23	54.4	0	11.1	288.5	22	30.5	346	22.4	288.5	19	41.9	332	43.9	288.7	15	35.3	319	22.8	289.0	10	25.5
20	32	8.3		23	55.4	18	44.4		23	53.8	4	59.6		22	28.8	351	11.0		19	39.0	337	32.6		15	31.3	324	11.8		10	20.8
40	36	57.4		23	55.9	23	33.0		23	53.2	9	48.1		22	27.0	355	59.5		19	36.0	342	21.4		15	27.4	329	0.8		10	16.2
22 0	41	46.4	289.0	23	56.4	28	21.7	288.6	23	52.6	14	36.6	288.5	22	25.2	0	48.0	288.5	19	33.1	347	10.1	288.8	15	23.5	333	49.8	289.0	10	11.5
20	46	35.5		23	56.9	33	10.3		23	52.0	19	25.0		22	23.4	5	36.6		19	30.1	351	58.9		15	19.5	338	38.8		10	6.8
40	51	24.5		23	57.4	37	59.0		23	51.4	24	13.5		22	21.5	10	25.1		19	27.1	356	47.6		15	15.6	343	27.8		10	2.2
23 0	56	13.5	289.0	23	57.8	42	47.6	288.6	23	50.7	29	2.0	288.5	22	19.7	15	13.7	288.6	19	24.1	1	36.4	288.8	15	11.6	348	16.8	289.0	9	57.5
20	61	2.5		23	58.3	47	36.2		23	50.0	33	50.5		22	17.8	20	2.2		19	21.1	6	25.2		15	7.6	353	5.9		9	52.8
40	65	51.5		23	58.7	52	24.9		23	49.3	38	39.0		22	15.9	24	50.8		19	18.1	11	13.9		15	3.6	357	54.9		9	48.1

2011 Moon

	18 Feb						19 Feb						20 Feb						21 Feb						22 Feb						23 Feb					
	GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec		
h m	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'
0 0	2	43.9	289.0	9	43.3	-4.7	349	41.5	289.2	3	48.0	-5.1	336	48.3	289.3	-2	21.6	-5.1	323	54.8	289.2	-8	19.8	-4.8	310	51.8	289.0	-13	42.8	-4.1	297	34.4	288.8	-18	10.4	-3.2
20	7	33.0		9	38.6		354	30.7		3	42.9		341	37.6		-2	26.7		328	44.0		-8	24.5		315	40.9		-13	46.9		302	23.2		-18	13.6	
40	12	22.0		9	33.9		359	19.9		3	37.8		346	26.9		-2	31.8		333	33.2		-8	29.3		320	29.9		-13	51.0		307	12.0		-18	16.9	
1 0	17	11.0	289.0	9	29.1	-4.7	4	9.2	289.2	3	32.7	-5.1	351	16.2	289.3	-2	36.9	-5.1	338	22.4	289.2	-8	34.1	-4.7	325	18.9	289.0	-13	55.1	-4.1	312	0.9	288.8	-18	20.1	-3.2
20	22	0.1		9	24.4		8	58.4		3	27.6		356	5.5		-2	42.0		343	11.6		-8	38.8		330	7.9		-13	59.3		316	49.7		-18	23.3	
40	26	49.1		9	19.6		13	47.6		3	22.4		0	54.8		-2	47.1		348	0.8		-8	43.6		334	57.0		-14	3.3		321	38.5		-18	26.5	
2 0	31	38.2	289.1	9	14.9	-4.8	18	36.8	289.2	3	17.3	-5.1	5	44.0	289.3	-2	52.2	-5.1	352	50.0	289.2	-8	48.3	-4.7	339	46.0	289.0	-14	7.4	-4.1	326	27.3	288.8	-18	29.7	-3.1
20	36	27.2		9	10.1		23	26.1		3	12.2		10	33.3		-2	57.3		357	39.2		-8	53.1		344	35.0		-14	11.5		331	16.1		-18	32.8	
40	41	16.3		9	5.3		28	15.3		3	7.1		15	22.6		-3	2.4		2	28.4		-8	57.8		349	24.0		-14	15.6		336	4.9		-18	36.0	
3 0	46	5.3	289.1	9	0.6	-4.8	33	4.5	289.2	3	2.0	-5.1	20	11.9	289.3	-3	7.5	-5.1	7	17.6	289.2	-9	2.5	-4.7	354	13.0	289.0	-14	19.6	-4.0	340	53.7	288.8	-18	39.1	-3.1
20	50	54.4		8	55.8		37	53.8		2	56.9		25	1.2		-3	12.6		12	6.8		-9	7.2		359	2.0		-14	23.7		345	42.5		-18	42.3	
40	55	43.4		8	51.0		42	43.0		2	51.8		29	50.4		-3	17.7		16	56.0		-9	11.9		3	51.0		-14	27.7		350	31.3		-18	45.4	
4 0	60	32.5	289.1	8	46.2	-4.8	47	32.2	289.2	2	46.6	-5.1	34	39.7	289.3	-3	22.8	-5.1	21	45.1	289.2	-9	16.6	-4.7	8	40.0	289.0	-14	31.7	-4.0	355	20.1	288.8	-18	48.5	-3.1
20	65	21.6		8	41.4		52	21.5		2	41.5		39	29.0		-3	27.8		26	34.3		-9	21.3		13	29.0		-14	35.7		0	8.9		-18	51.5	
40	70	10.7		8	36.6		57	10.7		2	36.4		44	18.3		-3	32.9		31	23.5		-9	26.0		18	18.0		-14	39.7		4	57.6		-18	54.6	
5 0	74	59.7	289.1	8	31.7	-4.8	61	60.0	289.2	2	31.3	-5.1	49	7.6	289.3	-3	38.0	-5.1	36	12.7	289.2	-9	30.7	-4.7	23	7.0	289.0	-14	43.7	-4.0	9	46.4	288.8	-18	57.7	-3.0
20	79	48.8		8	26.9		66	49.2		2	26.1		53	56.8		-3	43.1		41	1.9		-9	35.4		27	56.0		-14	47.6		14	35.2		-19	0.7	
40	84	37.9		8	22.1		71	38.5		2	21.0		58	46.1		-3	48.1		45	51.0		-9	40.0		32	44.9		-14	51.6		19	24.0		-19	3.7	
6 0	89	27.0	289.1	8	17.2	-4.8	76	27.7	289.2	2	15.9	-5.1	63	35.4	289.3	-3	53.2	-5.1	50	40.2	289.2	-9	44.7	-4.6	37	33.9	289.0	-14	55.6	-3.9	24	12.8	288.8	-19	6.7	-3.0
20	94	16.1		8	12.4		81	17.0		2	10.7		68	24.7		-3	58.2		55	29.4		-9	49.3		42	22.9		-14	59.5		29	1.5		-19	9.7	
40	99	5.2		8	7.5		86	6.2		2	5.6		73	13.9		-4	3.3		60	18.5		-9	54.0		47	11.9		-15	3.4		33	50.3		-19	12.7	
7 0	103	54.3	289.1	8	2.7	-4.9	90	55.5	289.3	2	0.5	-5.1	78	3.2	289.3	-4	8.4	-5.0	65	7.7	289.2	-9	58.6	-4.6	52	0.8	289.0	-15	7.3	-3.9	38	39.1	288.8	-19	15.7	-2.9
20	108	43.4		7	57.8		95	44.7		1	55.3		82	52.5		-4	13.4		69	56.9		-10	3.2		56	49.8		-15	11.2		43	27.8		-19	18.6	
40	113	32.5		7	52.9		100	34.0		1	50.2		87	41.8		-4	18.4		74	46.0		-10	7.8		61	38.8		-15	15.1		48	16.6		-19	21.6	
8 0	118	21.6	289.1	7	48.0	-4.9	105	23.2	289.3	1	45.1	-5.2	92	31.0	289.3	-4	23.5	-5.0	79	35.2	289.2	-10	12.4	-4.6	66	27.7	289.0	-15	19.0	-3.9	53	5.4	288.8	-19	24.5	-2.9
20	123	10.7		7	43.1		110	12.5		1	39.9		97	20.3		-4	28.5		84	24.4		-10	17.0		71	16.7		-15	22.9		57	54.1		-19	27.4	
40	127	59.8		7	38.3		115	1.7		1	34.8		102	9.6		-4	33.6		89	13.5		-10	21.6		76	5.7		-15	26.7		62	42.9		-19	30.3	
9 0	132	48.9	289.1	7	33.4	-4.9	119	51.0	289.3	1	29.6	-5.1	106	58.8	289.3	-4	38.6	-5.0	94	2.7	289.1	-10	26.2	-4.6	80	54.6	288.9	-15	30.6	-3.8	67	31.6	288.7	-19	33.2	-2.8
20	137	38.0		7	28.5		124	40.2		1	24.5		111	48.1		-4	43.6		98	51.8		-10	30.8		85	43.6		-15	34.4		72	20.4		-19	36.0	
40	142	27.1		7	23.5		129	29.5		1	19.4		116	37.4		-4	48.6		103	41.0		-10	35.3		90	32.5		-15	38.2		77	9.1		-19	38.9	
10 0	147	16.2	289.1	7	18.6	-4.9	134	18.8	289.3	1	14.2	-5.1	121	26.6	289.3	-4	53.6	-5.0	108	30.1	289.1	-10	39.9	-4.5	95	21.4	288.9	-15	42.0	-3.8	81	57.9	288.7	-19	41.7	-2.8
20	152	5.4		7	13.7		139	8.0		1	9.1		126	15.9		-4	58.7		113	19.2		-10	44.4		100	10.4		-15	45.8		86	46.6		-19	44.6	
40	156	54.5		7	8.8		143	57.3		1	3.9		131	5.2		-5	3.7		118	8.4		-10	49.0		104	59.3		-15	49.6		91	35.4		-19	47.4	
11 0	161	43.6	289.1	7	3.8	-4.9	148	46.6	289.3	0	58.8	-5.2	135	54.4	289.3	-5	8.7	-5.0	122	57.5	289.1	-10	53.5	-4.5	109	48.3	288.9	-15	53.4	-3.7	96	24.1	288.7	-19	50.2	-2.7
20	166	32.7		6	58.9		153	35.8		0	53.6		140	43.7		-5	13.7		127	46.7		-10	58.0		114	37.2		-15	57.1		101	12.8		-19	52.9	
40	171	21.9		6	54.0		158	25.1		0	48.5		145	33.0		-5	18.7		132	35.8		-11	2.5		119	26.1		-16	0.9		106	1.6		-19	55.7	
12 0	176	11.0	289.1	6	49.0	-5.0	163	14.4	289.3	0	43.3	-5.1	150	22.2	289.3	-5	23.7	-5.0	137	24.9	289.1	-11	7.0	-4.5	124	15.0	288.9	-16	4.6	-3.7	110	50.3	288.7	-19	58.4	-2.7
20	181	0.1		6	44.1		168	3.6		0	38.2		155	11.5		-5	28.6		142	14.1		-11	11.5		129	4.0		-16	8.3		115	39.0		-20	1.2	
40	185	49.3		6	39.1		172	52.9		0	33.0		160	0.7		-5	33.6		147	3.2		-11	16.0		133	52.9		-16	12.0		120	27.8		-20	3.9	
13 0	190	38.4	289.1	6	34.1	-5.0	177	42.2	289.3	0	27.9	-5.2	164	50.0	289.3	-5	38.6	-5.0	151	52.3	289.1	-11	20.5	-4.5	138	41.8	288.9	-16	15.7	-3.7	125	16.5	288.7	-20	6.6	-2.7
20	195	27.6		6	29.2		182	31.4		0	22.7		169	39.3		-5	43.6		156	41.4		-11	24.9		143	30.7		-16	19.4		130	5.2		-20	9.3	
40	200	16.7		6	24.2		187	20.7		0	17.6		174	28.5		-5	48.5		161	30.5		-11	29.4		148	19.6		-16	23.1		134	53.9		-20	12.0	
14 0	205	5.9	289.2	6	19.2	-5.0	192	10.0	289.3	0	12.4	-5.1	179	17.8	289.3	-5	53.5	-5.0	166	19.7	289.1	-11	33.9	-4.4	153	8.5	288.9	-16	26.7	-3.6	139	42.7	288.7	-20	14.6	-2.6
20	209	55.0		6	14.2		196	59.2		0	7.3		184	7.0		-5	58.5		171	8.8		-11	38.3		157	57.4		-16	30.4		144	31.4		-20	17.3	
40	214	44.2		6	9.3		201	48.5		0	2.2		188	56.3		-6	3.4		175	57.9		-11	42.7		162	46.3		-16	34.0		149	20.1		-20	19.9	
15 0	219	33.4	289.2	6	4.3	-5.0	206	37.8	289.3	-0	3.0	-5.1	193	45.5	289.2	-6	8.4	-4.9	180	47.0	289.1	-11	47.1	-4.4	167	35.2	288.9	-16	37.6	-3.6	154	8.8	288.7	-20	22.5	-2.6
20	224	22.5		5	59.3		211	27.1		-0	8.1		198	34.8		-6	13.3		185	36.1		-11	51.6		172	24.1		-16	41.2		158	57.5		-20	25.1	
40	229	11.7		5	54.3		216	16.3		-0	13.3		203	24.0		-6	18.2		190	25.2		-11	56.0		177	13.0		-16	44.8		163	46.2		-20	27.7	
16 0	234	0.8	289.2	5	49.3	-5.0	221	5.6	289.3	-0	18.4	-5.2	208	13.3	289.2	-6	23.2	-4.9	195	14.3	289.1	-12	0.3	-4.4	182	1.9	288.9	-16	48.4	-3.6	168	35.0	288.7	-20	30.3	-2.5
20	238	50.0		5	44.2		225	54.9		-0	23.6		213	2.5		-6	28.1		200	3.4		-12	4.7		186	50.8		-16	52.0		173	23.7		-20	32.8	
40	243	39.2		5	39.2		230	44.2		-0	28.7		217	51.8		-6	33.0		204	52.5		-12	9.1		191	39.7		-16	55.5		178	12.4		-20	35.4	
17 0	248	28.4	289.2	5	34.2	-5.0	235	33.5	289.3	-0	33.9	-5.1	222	41.0	289.2	-6	37.9	-4.9	209	41.6	289.1	-12	13.5	-4.3	196	28.6	288.9	-16	59.1	-3.5	183	1.1	288.7	-20	37.9	-2.5
20	253	17.5		5	29.2		240	22.7		-0	39.0		227	30.3		-6	42.8		214	30.7		-12	17.8		201	17.4		-17	2.6		187	49.8		-20	40.4	
40	258	6.7		5	24.2		245	12.0		-0	44.2		232	19.5		-6	47.7		219	19.7		-12	22.2		206	6.3		-17	6.1		192	38.5		-20	42.9	
18 0	262	55.9	289.2	5	19.1	-5.0	250	1.3	289.3	-0	49.3	-5.1	237	8.7	289.2	-6	52.6	-4.9	224	8.8	289.1	-12	26.5	-4.3	210	55.2	288.9	-17	9.6	-3.5	197	27.2	288.7	-20	45.4	-2.4
20	267	45.1		5	14.1		254	50.6		-0	54.4		241	58.0		-6	57.5		228	57.9		-12	30.8		215	44.1		-17	13.1		202	15.9		-20	47.8	
40	272	34.3		5	9.1		259	39.8		-0	59.6		246	47.2		-7	2.4		233	47.0		-12	35.1		220	32.9		-17	16.6		207	4.6		-20	50.3	
19 0	277	23.4	289.2	5	4.0	-5.0	264	29.1	289.3	-1	4.7	-5.1	251	36.5	289.2	-7	7.3	-4.9	238	36.1	289.1	-12	39.4	-4.3	225	21.8	288.9	-17	20.0	-3.5	211	53.3	288.7	-20	52.7	-2.4
20	282	12.6		4	59.0		269	18.4		-1	9.9		256	25.7		-7	12.2		243	25.1		-12	43.7		230	10.7		-17	23.5		216	42.0		-20	55.1	
40	287	1.8		4	53.9		274	7.7		-1	15.0		261	14.9		-7	17.0		248	14.2		-12	48.0		234	59.5		-17	26.9		221	30.7		-20	57.5	
20 0	291	51.0	289.2	4	48.9	-5.1	278	57.0	289.3	-1	20.1	-5.1	266	4.1	289.2	-7	21.9	-4.9	253	3.3	289.1	-12	52.3	-4.2	239	48.4	288.9	-17	30.4	-3.4	226	19.4	288.7	-20	59.9	-2.4
20	296	40.2		4	43.8		283	46.2		-1	25.3		270	53.4		-7	26.8		257	52.3		-12	56.6		244	37.2		-17	33.8		231	8.0		-21	2.3	
40	301	29.4		4	38.7		288	35.5		-1	30.4		275	42.6		-7	31.6		262	41.4		-13	0.8		249	26.1		-17	37.2		235	56.7		-21	4.7	
21 0	306	18.6	289.2	4	33.7	-5.1	293	24.8	289.3	-1	35.5	-5.1	280	31.8	289.2	-7	36.5	-4.8	267	30.5	289.1	-13	5.0	-4.2	254	14.9	288.8	-17	40.5	-3.4	240	45.4	288.7	-21	7.0	-2.3
20	311	7.8		4	28.6		298	14.1		-1	40.6		285	21.0		-7	41.3		272	19.5		-13	9.3		259	3.8		-17	43.9		245	34.1		-21	9.3	
40	315	57.0		4	23.5		303	3.4		-1	45.8		290	10.3		-7	46.1		277	8.6		-13	13.5		263	52.6		-17	47.3		250	22.8		-21	11.6	
22 0	320	46.2	289.2	4	18.5	-5.1	307	52.7	289.3	-1	50.9	-5.1	294	59.5	289.2	-7	51.0	-4.8	281	57.6	289.0	-13	17.7	-4.2	268	41.4	288.8	-17	50.6	-3.3	255	11.5	288.7	-21	13.9	-2.3
20	325	35.4		4	13.4		312	41.9		-1	56.0		299	48.7		-7	55.8		286	46.7		-13	21.9		273	30.3		-17	53.9		260	0.2		-21	16.2	
40	330	24.6		4	8.3		317	31.2		-2	1.1		304	37.9		-8	0.6		291	35.7		-13	26.1		278	19.1		-17	57.3		264	48.8		-21	18.5	
23 0	335	13.9	289.2	4	3.2	-5.1	322	20.5	289.3	-2	6.3	-5.1	309	27.1	289.2	-8	5.4	-4.8	296	24.7	289.0	-13	30.3	-4.2	283	7.9	288.8	-18	0.6	-3.3	269	37.5	288.7	-21	20.7	-2.2
20	340	3.1		3	58.1		327	9.8		-2	11.4		314	16.4		-8	10.2		301	13.8		-13	34.5		287	56.8		-18	3.9		274	26.2		-21	23.0	
40	344	52.3		3	53.0		331	59.1		-2	16.5		319	5.6		-8	15.0		306	2.8		-13	38.6		292	45.6		-18	7.1		279	14.9		-21	25.2	

2011 Moon

	24 Feb						25 Feb						26 Feb						27 Feb						28 Feb						1 Mar					
	GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec		
h m	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'
0 0	284	3.5	288.7	-21	27.4	-2.2	270	27.3	288.7	-23	24.5	-1.0	256	59.3	288.9	-23	59.0	0.1	243	54.1	289.3	-23	14.6	1.2	231	23.4	289.9	-21	19.9	2.0	219	32.6	290.4	-18	26.5	2.8
20	288	52.2		-21	29.6		275	16.0		-23	25.5		261	48.2		-23	58.9		248	43.4		-23	13.4		236	13.2		-21	17.9		224	23.0		-18	23.8	
40	293	40.9		-21	31.7		280	4.7		-23	26.5		266	37.1		-23	58.8		253	32.8		-23	12.3		241	3.1		-21	15.8		229	13.5		-18	21.0	
1 0	298	29.6	288.7	-21	33.9	-2.1	284	53.4	288.7	-23	27.5	-1.0	271	26.0	288.9	-23	58.6	0.1	258	22.1	289.3	-23	11.1	1.2	245	52.9	289.9	-21	13.8	2.1	234	3.9	290.4	-18	18.2	2.8
20	303	18.2		-21	36.0		289	42.1		-23	28.5		276	14.9		-23	58.5		263	11.4		-23	9.9		250	42.8		-21	11.7		238	54.3		-18	15.4	
40	308	6.9		-21	38.2		294	30.8		-23	29.5		281	3.9		-23	58.4		268	0.8		-23	8.8		255	32.7		-21	9.6		243	44.8		-18	12.7	
2 0	312	55.6	288.7	-21	40.3	-2.1	299	19.5	288.7	-23	30.5	-0.9	285	52.8	288.9	-23	58.2	0.2	272	50.1	289.4	-23	7.6	1.2	260	22.6	289.9	-21	7.5	2.1	248	35.2	290.5	-18	9.8	2.8
20	317	44.2		-21	42.4		304	8.2		-23	31.4		290	41.7		-23	58.0		277	39.5		-23	6.3		265	12.5		-21	5.4		253	25.7		-18	7.0	
40	322	32.9		-21	44.4		308	56.9		-23	32.4		295	30.7		-23	57.8		282	28.8		-23	5.1		270	2.4		-21	3.3		258	16.2		-18	4.2	
3 0	327	21.6	288.7	-21	46.5	-2.0	313	45.6	288.7	-23	33.3	-0.9	300	19.6	289.0	-23	57.6	0.2	287	18.2	289.4	-23	3.9	1.3	274	52.3	289.9	-21	1.2	2.2	263	6.6	290.5	-18	1.4	2.9
20	332	10.2		-21	48.5		318	34.3		-23	34.2		305	8.6		-23	57.4		292	7.6		-23	2.6		279	42.2		-20	59.0		267	57.1		-17	58.5	
40	336	58.9		-21	50.6		323	23.0		-23	35.0		309	57.5		-23	57.1		296	57.0		-23	1.3		284	32.2		-20	56.9		272	47.6		-17	55.7	
4 0	341	47.6	288.7	-21	52.6	-2.0	328	11.7	288.7	-23	35.9	-0.8	314	46.5	289.0	-23	56.9	0.3	301	46.4	289.4	-23	0.1	1.3	289	22.1	290.0	-20	54.7	2.2	277	38.1	290.5	-17	52.8	2.9
20	346	36.2		-21	54.6		333	0.4		-23	36.8		319	35.4		-23	56.6		306	35.8		-22	58.8		294	12.0		-20	52.6		282	28.6		-17	50.0	
40	351	24.9		-21	56.6		337	49.1		-23	37.6		324	24.4		-23	56.3		311	25.2		-22	57.4		299	2.0		-20	50.4		287	19.1		-17	47.1	
5 0	356	13.5	288.7	-21	58.5	-2.0	342	37.8	288.7	-23	38.4	-0.8	329	13.4	289.0	-23	56.0	0.3	316	14.6	289.4	-22	56.1	1.3	303	51.9	290.0	-20	48.2	2.2	292	9.6	290.5	-17	44.2	2.9
20	1	2.2		-22	0.5		347	26.5		-23	39.2		334	2.3		-23	55.7		321	4.0		-22	54.8		308	41.9		-20	46.0		297	0.2		-17	41.3	
40	5	50.9		-22	2.4		352	15.3		-23	40.0		338	51.3		-23	55.4		325	53.4		-22	53.4		313	31.9		-20	43.8		301	50.7		-17	38.4	
6 0	10	39.5	288.7	-22	4.4	-1.9	357	4.0	288.7	-23	40.8	-0.7	343	40.3	289.0	-23	55.0	0.4	330	42.9	289.4	-22	52.1	1.4	318	21.9	290.0	-20	41.6	2.3	306	41.2	290.6	-17	35.5	2.9
20	15	28.2		-22	6.3		1	52.7		-23	41.5		348	29.3		-23	54.6		335	32.3		-22	50.7		323	11.9		-20	39.3		311	31.8		-17	32.6	
40	20	16.8		-22	8.1		6	41.4		-23	42.3		353	18.3		-23	54.3		340	21.8		-22	49.3		328	1.9		-20	37.1		316	22.3		-17	29.7	
7 0	25	5.5	288.7	-22	10.0	-1.8	11	30.1	288.7	-23	43.0	-0.7	358	7.3	289.0	-23	53.9	0.4	345	11.2	289.5	-22	47.9	1.4	332	51.9	290.0	-20	34.8	2.3	321	12.9	290.6	-17	26.8	3.0
20	29	54.2		-22	11.9		16	18.9		-23	43.7		2	56.3		-23	53.5		350	0.7		-22	46.5		337	41.9		-20	32.6		326	3.5		-17	23.8	
40	34	42.8		-22	13.7		21	7.6		-23	44.4		7	45.3		-23	53.0		354	50.2		-22	45.1		342	31.9		-20	30.3		330	54.1		-17	20.9	
8 0	39	31.5	288.7	-22	15.5	-1.8	25	56.3	288.7	-23	45.1	-0.6	12	34.3	289.0	-23	52.6	0.5	359	39.6	289.5	-22	43.6	1.5	347	21.9	290.0	-20	28.0	2.3	335	44.6	290.6	-17	17.9	3.0
20	44	20.1		-22	17.4		30	45.1		-23	45.7		17	23.4		-23	52.1		4	29.1		-22	42.2		352	12.0		-20	25.7		340	35.2		-17	14.9	
40	49	8.8		-22	19.2		35	33.8		-23	46.4		22	12.4		-23	51.7		9	18.6		-22	40.7		357	2.0		-20	23.4		345	25.8		-17	12.0	
9 0	53	57.4	288.7	-22	20.9	-1.8	40	22.6	288.7	-23	47.0	-0.6	27	1.4	289.0	-23	51.2	0.5	14	8.1	289.5	-22	39.2	1.5	1	52.1	290.1	-20	21.1	2.3	350	16.5	290.6	-17	9.0	3.0
20	58	46.1		-22	22.7		45	11.3		-23	47.6		31	50.5		-23	50.7		18	57.6		-22	37.7		6	42.1		-20	18.8		355	7.1		-17	6.0	
40	63	34.8		-22	24.4		50	0.0		-23	48.2		36	39.5		-23	50.2		23	47.1		-22	36.2		11	32.2		-20	16.4		359	57.7		-17	3.0	
10 0	68	23.4	288.7	-22	26.2	-1.7	54	48.8	288.8	-23	48.8	-0.5	41	28.6	289.1	-23	49.7	0.6	28	36.7	289.5	-22	34.7	1.5	16	22.3	290.1	-20	14.1	2.4	4	48.3	290.6	-17	0.0	3.0
20	73	12.1		-22	27.9		59	37.5		-23	49.4		46	17.6		-23	49.1		33	26.2		-22	33.2		21	12.4		-20	11.7		9	39.0		-16	57.0	
40	78	0.7		-22	29.6		64	26.3		-23	49.9		51	6.7		-23	48.6		38	15.7		-22	31.6		26	2.5		-20	9.3		14	29.6		-16	54.0	
11 0	82	49.4	288.7	-22	31.3	-1.6	69	15.1	288.8	-23	50.4	-0.5	55	55.8	289.1	-23	48.0	0.6	43	5.3	289.6	-22	30.1	1.6	30	52.6	290.1	-20	7.0	2.4	19	20.3	290.7	-16	51.0	3.1
20	87	38.0		-22	32.9		74	3.8		-23	51.0		60	44.8		-23	47.4		47	54.8		-22	28.5		35	42.7		-20	4.6		24	10.9		-16	47.9	
40	92	26.7		-22	34.6		78	52.6		-23	51.5		65	33.9		-23	46.8		52	44.4		-22	26.9		40	32.8		-20	2.2		29	1.6		-16	44.9	
12 0	97	15.3	288.7	-22	36.2	-1.6	83	41.3	288.8	-23	51.9	-0.5	70	23.0	289.1	-23	46.2	0.6	57	33.9	289.6	-22	25.3	1.6	45	22.9	290.1	-19	59.8	2.4	33	52.3	290.7	-16	41.8	3.1
20	102	4.0		-22	37.8		88	30.1		-23	52.4		75	12.1		-23	45.6		62	23.5		-22	23.7		50	13.0		-19	57.3		38	43.0		-16	38.8	
40	106	52.7		-22	39.4		93	18.9		-23	52.9		80	1.2		-23	44.9		67	13.1		-22	22.1		55	3.2		-19	54.9		43	33.6		-16	35.7	
13 0	111	41.3	288.7	-22	41.0	-1.6	98	7.7	288.8	-23	53.3	-0.4	84	50.3	289.1	-23	44.3	0.7	72	2.7	289.6	-22	20.5	1.7	59	53.3	290.2	-19	52.5	2.5	48	24.3	290.7	-16	32.6	3.1
20	116	30.0		-22	42.6		102	56.4		-23	53.7		89	39.4		-23	43.6		76	52.3		-22	18.8		64	43.5		-19	50.0		53	15.0		-16	29.6	
40	121	18.6		-22	44.2		107	45.2		-23	54.1		94	28.5		-23	42.9		81	41.9		-22	17.2		69	33.7		-19	47.6		58	5.8		-16	26.5	
14 0	126	7.3	288.7	-22	45.7	-1.5	112	34.0	288.8	-23	54.5	-0.4	99	17.6	289.1	-23	42.2	0.7	86	31.5	289.6	-22	15.5	1.7	74	23.8	290.2	-19	45.1	2.5	62	56.5	290.7	-16	23.4	3.1
20	130	55.9		-22	47.2		117	22.8		-23	54.9		104	6.8		-23	41.5		91	21.1		-22	13.8		79	14.0		-19	42.6		67	47.2		-16	20.3	
40	135	44.6		-22	48.7		122	11.6		-23	55.3		108	55.9		-23	40.8		96	10.7		-22	12.1		84	4.2		-19	40.1		72	37.9		-16	17.2	
15 0	140	33.3	288.7	-22	50.2	-1.5	127	0.4	288.8	-23	55.6	-0.3	113	45.0	289.2	-23	40.0	0.8	101	0.4	289.6	-22	10.4	1.7	88	54.4	290.2	-19	37.6	2.5	77	28.7	290.8	-16	14.0	3.1
20	145	21.9		-22	51.7		131	49.2		-23	55.9		118	34.2		-23	39.2		105	50.0		-22	8.7		93	44.6		-19	35.1		82	19.4		-16	10.9	
40	150	10.6		-22	53.2		136	38.0		-23	56.2		123	23.3		-23	38.5		110	39.7		-22	7.0		98	34.8		-19	32.6		87	10.2		-16	7.8	
16 0	154	59.2	288.7	-22	54.6	-1.4	141	26.8	288.8	-23	56.5	-0.3	128	12.5	289.2	-23	37.7	0.8	115	29.3	289.7	-22	5.3	1.8	103	25.0	290.2	-19	30.1	2.6	92	0.9	290.8	-16	4.6	3.1
20	159	47.9		-22	56.0		146	15.6		-23	56.8		133	1.6		-23	36.9		120	19.0		-22	3.5		108	15.3		-19	27.5		96	51.7		-16	1.5	
40	164	36.6		-22	57.4		151	4.4		-23	57.1		137	50.8		-23	36.1		125	8.7		-22	1.7		113	5.5		-19	25.0		101	42.5		-15	58.3	
17 0	169	25.2	288.7	-22	58.8	-1.4	155	53.2	288.8	-23	57.3	-0.2	142	40.0	289.2	-23	35.2	0.8	129	58.3	289.7	-22	0.0	1.8	117	55.7	290.3	-19	22.4	2.6	106	33.3	290.8	-15	55.2	3.2
20	174	13.9		-23	0.2		160	42.1		-23	57.6		147	29.2		-23	34.4		134	48.0		-21	58.2		122	46.0		-19	19.9		111	24.0		-15	52.0	
40	179	2.5		-23	1.6		165	30.9		-23	57.8		152	18.4		-23	33.5		139	37.7		-21	56.4		127	36.2		-19	17.3		116	14.8		-15	48.8	
18 0	183	51.2	288.7	-23	2.9	-1.3	170	19.7	288.8	-23	58.0	-0.2	157	7.5	289.2	-23	32.7	0.9	144	27.4	289.7	-21	54.6	1.9	132	26.5	290.3	-19	14.7	2.6	121	5.6	290.8	-15	45.7	3.2
20	188	39.9		-23	4.3		175	8.5		-23	58.2		161	56.7		-23	31.8		149	17.1		-21	52.7		137	16.8		-19	12.1		125	56.4		-15	42.5	
40	193	28.5		-23	5.6		179	57.4		-23	58.3		166	46.0		-23	30.9		154	6.8		-21	50.9		142	7.1		-19	9.5		130	47.3		-15	39.3	
19 0	198	17.2	288.7	-23	6.9	-1.3	184	46.2	288.8	-23	58.5	-0.1	171	35.2	289.2	-23	30.0	1.0	158	56.6	289.7	-21	49.0	1.9	146	57.3	290.3	-19	6.9	2.6	135	38.1	290.8	-15	36.1	3.2
20	203	5.9		-23	8.2		189	35.1		-23	58.6		176	24.4		-23	29.0		163	46.3		-21	47.2		151	47.6		-19	4.3		140	28.9		-15	32.9	
40	207	54.5		-23	9.4		194	23.9		-23	58.8		181	13.6		-23	28.1		168	36.0		-21	45.3		156	38.0		-19	1.6		145	19.8		-15	29.6	
20 0	212	43.2	288.7	-23	10.7	-1.2	199	12.8	288.9	-23	58.9	-0.1	186	2.8	289.2	-23	27.1	1.0	173	25.8	289.8	-21	43.4	1.9	161	28.3	290.3	-18	59.0	2.7	150	10.6	290.9	-15	26.4	3.2
20	217	31.9		-23	11.9		204	1.6		-23	59.0		190	52.1		-23	26.2		178	15.5		-21	41.5		166	18.6		-18	56.3		155	1.5		-15	23.2	
40	222	20.6		-23	13.1		208	50.5		-23	59.0		195	41.3		-23	25.2		183	5.3		-21	39.6		171	8.9		-18	53.7		159	52.3		-15	19.9	
21 0	227	9.2	288.7	-23	14.3	-1.2	213	39.3	288.9	-23	59.1	0.0	200	30.6	289.3	-23	24.2	1.0	187	55.1	289.8	-21	37.7	1.9	175	59.3	290.4	-18	51.0	2.7	164	43.2	290.9	-15	16.7	3.3
20	231	57.9		-23	15.5		218	28.2		-23	59.1		205	19.8		-23	23.2		192	44.9		-21	35.8		180	49.6		-18	48.3		169	34.0		-15	13.4	
40	236	46.6		-23	16.7		223	17.1		-23	59.2		210	9.1		-23	22.1		197	34.6		-21	33.8		185	39.9		-18	45.6		174	24.9		-15	10.2	
22 0	241	35.3	288.7	-23	17.9	-1.1	228	5.9	288.9	-23	59.2	0.0	214	58.4	289.3	-23	21.1	1.1	202	24.4	289.8	-21	31.9	2.0	190	30.3	290.4	-18	42.9	2.7	179	15.8	290.9	-15	6.9	3.3
20	246	23.9		-23	19.0		232	54.8		-23	59.2		219	47.6		-23	20.0		207	14.2		-21	29.9		195	20.7		-18	40.2		184	6.7		-15	3.7	
40	251	12.6		-23	20.1		237	43.7		-23	59.2		224	36.9		-23	19.0		212	4.1		-21	27.9		200	11.1		-18	37.5		188	57.6		-15	0.4	
23 0	256	1.3	288.7	-23	21.2	-1.1	242	32.6	288.9	-23	59.2	0.1	229	26.2	289.3	-23	17.9	1.1	216	53.9	289.8	-21	25.9	2.0	205	1.4	290.4	-18	34.8	2.8	193	48.5	290.9	-14	57.1	3.3
20	260	50.0		-23	22.3		247	21.5		-23	59.1		234	15.5		-23	16.8		221	43.7		-21	23.9		209	51.8		-18	32.0		198	39.4		-14	53.8	
40	265	38.7		-23	23.4		252	10.4		-23	59.0		239	4.8		-23	15.7		226	33.5		-21	21.9		214	42.2		-18	29.3		203	30.3		-14	50.5	

2011 Moon

	2 Mar							3 Mar							4 Mar							5 Mar							6 Mar							7 Mar						
	GHA			Dec				GHA			Dec				GHA			Dec				GHA			Dec				GHA			Dec				GHA			Dec			
h m	°	'	d	°	'	d	'	°	'	d	°	'	d	'	°	'	d	°	'	d	'	°	'	d	°	'	d	'	°	'	d	°	'	d	'	°	'	d	°	'	d	'
0 0	208	21.3		-14	47.2			197	43.8		-10	34.3			187	32.0		-5	59.5			177	35.8		-1	13.6			167	44.7		3	33.5			157	48.2		8	12.1		
20	213	12.2	290.9	-14	43.9	3.3		202	35.2	291.4	-10	30.6	3.7		192	23.6	291.6	-5	55.6	3.9		182	27.6	291.8	-1	9.6	4.0		172	36.5	291.8	3	37.4	3.9		162	39.8	291.6	8	15.9	3.8	
40	218	3.1		-14	40.6			207	26.5		-10	26.9			197	15.3		-5	51.7			187	19.4		-1	5.6			177	28.3		3	41.4			167	31.5		8	19.6		
1 0	222	54.1		-14	37.2			212	17.9		-10	23.2			202	6.9		-5	47.8			192	11.1		-1	1.6			182	20.1		3	45.3			172	23.1		8	23.4		
20	227	45.0	291.0	-14	33.9	3.3		217	9.3	291.4	-10	19.5	3.7		206	58.6	291.6	-5	43.8	3.9		197	2.9	291.8	-0	57.6	4.0		187	11.8	291.8	3	49.3	4.0		177	14.7	291.6	8	27.2	3.8	
40	232	36.0		-14	30.6			222	0.6		-10	15.8			211	50.2		-5	39.9			201	54.7		-0	53.6			192	3.6		3	53.2			182	6.3		8	30.9		
2 0	237	26.9		-14	27.2			226	52.0		-10	12.1			216	41.9		-5	36.0			206	46.5		-0	49.6			196	55.4		3	57.2			186	57.9		8	34.7		
20	242	17.9	291.0	-14	23.9	3.3		231	43.4	291.4	-10	8.4	3.7		221	33.5	291.7	-5	32.1	3.9		211	38.3	291.8	-0	45.6	4.0		201	47.1	291.8	4	1.1	3.9		191	49.5	291.6	8	38.4	3.7	
40	247	8.9		-14	20.5			236	34.8		-10	4.7			226	25.2		-5	28.1			216	30.1		-0	41.6			206	38.9		4	5.0			196	41.1		8	42.1		
3 0	251	59.9		-14	17.2			241	26.2		-10	0.9			231	16.8		-5	24.2			221	21.9		-0	37.6			211	30.7		4	9.0			201	32.7		8	45.9		
20	256	50.9	291.0	-14	13.8	3.4		246	17.6	291.4	-9	57.2	3.7		236	8.5	291.7	-5	20.3	3.9		226	13.6	291.8	-0	33.6	4.0		216	22.4	291.8	4	12.9	3.9		206	24.3	291.6	8	49.6	3.7	
40	261	41.9		-14	10.4			251	8.9		-9	53.5			241	0.2		-5	16.3			231	5.4		-0	29.6			221	14.2		4	16.8			211	15.9		8	53.3		
4 0	266	32.9		-14	7.1			256	0.3		-9	49.7			245	51.8		-5	12.4			235	57.2		-0	25.6			226	6.0		4	20.8			216	7.5		8	57.1		
20	271	23.9	291.0	-14	3.7	3.4		260	51.8	291.4	-9	46.0	3.7		250	43.5	291.7	-5	8.4	4.0		240	49.0	291.8	-0	21.6	4.0		230	57.7	291.8	4	24.7	3.9		220	59.1	291.6	9	0.8	3.7	
40	276	14.9		-14	0.3			265	43.2		-9	42.3			255	35.2		-5	4.5			245	40.8		-0	17.6			235	49.5		4	28.6			225	50.7		9	4.5		
5 0	281	5.9		-13	56.9			270	34.6		-9	38.5			260	26.9		-5	0.5			250	32.6		-0	13.6			240	41.2		4	32.5			230	42.3		9	8.2		
20	285	56.9	291.0	-13	53.5	3.4		275	26.0	291.4	-9	34.8	3.8		265	18.5	291.7	-4	56.6	3.9		255	24.4	291.8	-0	9.6	4.0		245	33.0	291.8	4	36.5	3.9		235	33.9	291.6	9	11.9	3.7	
40	290	48.0		-13	50.1			280	17.4		-9	31.0			270	10.2		-4	52.6			260	16.2		-0	5.6			250	24.8		4	40.4			240	25.4		9	15.6		
6 0	295	39.0		-13	46.6			285	8.9		-9	27.2			275	1.9		-4	48.7			265	8.0		-0	1.6			255	16.5		4	44.3			245	17.0		9	19.3		
20	300	30.1	291.1	-13	43.2	3.4		290	0.3	291.4	-9	23.5	3.8		279	53.6	291.7	-4	44.7	4.0		269	59.8	291.8	0	2.4	4.0		260	8.3	291.8	4	48.2	3.9		250	8.6	291.6	9	23.0	3.7	
40	305	21.1		-13	39.8			294	51.7		-9	19.7			284	45.3		-4	40.8			274	51.6		0	6.4			265	0.0		4	52.1			255	0.1		9	26.7		
7 0	310	12.2		-13	36.4			299	43.2		-9	15.9			289	37.0		-4	36.8			279	43.4		0	10.4			269	51.8		4	56.1			259	51.7		9	30.4		
20	315	3.2	291.1	-13	32.9	3.5		304	34.6	291.5	-9	12.2	3.8		294	28.6	291.7	-4	32.9	3.9		284	35.1	291.8	0	14.4	4.0		274	43.5	291.7	5	0.0	3.9		264	43.3	291.6	9	34.1	3.7	
40	319	54.3		-13	29.5			309	26.1		-9	8.4			299	20.3		-4	28.9			289	26.9		0	18.4			279	35.3		5	3.9			269	34.8		9	37.8		
8 0	324	45.4		-13	26.0			314	17.5		-9	4.6			304	12.0		-4	25.0			294	18.7		0	22.4			284	27.0		5	7.8			274	26.4		9	41.5		
20	329	36.5	291.1	-13	22.6	3.5		319	9.0	291.5	-9	0.8	3.8		309	3.7	291.7	-4	21.0	4.0		299	10.5	291.8	0	26.4	4.0		289	18.7	291.7	5	11.7	3.9		279	17.9	291.5	9	45.1	3.7	
40	334	27.6		-13	19.1			324	0.4		-8	57.0			313	55.4		-4	17.0			304	2.3		0	30.4			294	10.5		5	15.6			284	9.5		9	48.8		
9 0	339	18.6		-13	15.6			328	51.9		-8	53.2			318	47.2		-4	13.1			308	54.1		0	34.4			299	2.2		5	19.5			289	1.0		9	52.5		
20	344	9.8	291.1	-13	12.2	3.5		333	43.4	291.5	-8	49.4	3.8		323	38.9	291.7	-4	9.1	4.0		313	45.9	291.8	0	38.4	4.0		303	54.0	291.7	5	23.4	3.9		293	52.5	291.5	9	56.1	3.7	
40	349	0.9		-13	8.7			338	34.9		-8	45.6			328	30.6		-4	5.1			318	37.7		0	42.4			308	45.7		5	27.3			298	44.1		9	59.8		
10 0	353	52.0		-13	5.2			343	26.3		-8	41.8			333	22.3		-4	1.2			323	29.5		0	46.4			313	37.4		5	31.2			303	35.6		10	3.5		
20	358	43.1	291.1	-13	1.7	3.5		348	17.8	291.5	-8	38.0	3.8		338	14.0	291.7	-3	57.2	4.0		328	21.3	291.8	0	50.4	4.0		318	29.2	291.7	5	35.0	3.9		308	27.1	291.5	10	7.1	3.6	
40	3	34.2		-12	58.2			353	9.3		-8	34.2			343	5.7		-3	53.2			333	13.1		0	54.4			323	20.9		5	38.9			313	18.6		10	10.8		
11 0	8	25.3		-12	54.7			358	0.8		-8	30.4			347	57.4		-3	49.3			338	4.9		0	58.4			328	12.6		5	42.8			318	10.2		10	14.4		
20	13	16.5	291.1	-12	51.2	3.5		2	52.3	291.5	-8	26.6	3.8		352	49.2	291.7	-3	45.3	4.0		342	56.7	291.8	1	2.4	4.0		333	4.4	291.7	5	46.7	3.9		323	1.7	291.5	10	18.0	3.6	
40	18	7.6		-12	47.7			7	43.8		-8	22.8			357	40.9		-3	41.3			347	48.5		1	6.4			337	56.1		5	50.6			327	53.2		10	21.7		
12 0	22	58.8		-12	44.2			12	35.3		-8	19.0			2	32.6		-3	37.3			352	40.3		1	10.4			342	47.8		5	54.5			332	44.7		10	25.3		
20	27	49.9	291.2	-12	40.7	3.5		17	26.8	291.5	-8	15.1	3.8		7	24.3	291.7	-3	33.3	4.0		357	32.1	291.8	1	14.4	4.0		347	39.5	291.7	5	58.3	3.9		337	36.2	291.5	10	28.9	3.6	
40	32	41.1		-12	37.1			22	18.3		-8	11.3			12	16.1		-3	29.4			2	23.9		1	18.4			352	31.2		6	2.2			342	27.7		10	32.5		
13 0	37	32.3		-12	33.6			27	9.9		-8	7.5			17	7.8		-3	25.4			7	15.7		1	22.4			357	22.9		6	6.1			347	19.2		10	36.1		
20	42	23.4	291.2	-12	30.1	3.5		32	1.4	291.5	-8	3.7	3.8		21	59.5	291.7	-3	21.4	4.0		12	7.5	291.8	1	26.4	4.0		2	14.7	291.7	6	9.9	3.9		352	10.7	291.5	10	39.8	3.6	
40	47	14.6		-12	26.5			36	52.9		-7	59.8			26	51.3		-3	17.4			16	59.3		1	30.4			7	6.4		6	13.8			357	2.2		10	43.4		
14 0	52	5.8		-12	23.0			41	44.4		-7	56.0			31	43.0		-3	13.4			21	51.1		1	34.3			11	58.1		6	17.7			1	53.6		10	47.0		
20	56	57.0	291.2	-12	19.4	3.6		46	36.0	291.5	-7	52.1	3.9		36	34.7	291.7	-3	9.5	4.0		26	42.9	291.8	1	38.3	4.0		16	49.8	291.7	6	21.5	3.8		6	45.1	291.5	10	50.6	3.6	
40	61	48.2		-12	15.9			51	27.5		-7	48.3			41	26.5		-3	5.5			31	34.7		1	42.3			21	41.5		6	25.4			11	36.6		10	54.1		
15 0	66	39.4		-12	12.3			56	19.1		-7	44.4			46	18.2		-3	1.5			36	26.5		1	46.3			26	33.2		6	29.2			16	28.1		10	57.7		
20	71	30.6	291.2	-12	8.7	3.6		61	10.6	291.5	-7	40.6	3.8		51	10.0	291.7	-2	57.5	4.0		41	18.3	291.8	1	50.3	4.0		31	24.9	291.7	6	33.1	3.9		21	19.5	291.5	11	1.3	3.6	
40	76	21.8		-12	5.2			66	2.2		-7	36.7			56	1.7		-2	53.5			46	10.0		1	54.3			36	16.6		6	36.9			26	11.0		11	4.9		
16 0	81	13.0		-12	1.6			70	53.7		-7	32.9			60	53.4		-2	49.5			51	1.8		1	58.3			41	8.3		6	40.8			31	2.4		11	8.5		
20	86	4.2	291.2	-11	58.0	3.6		75	45.3	291.6	-7	29.0	3.9		65	45.2	291.7	-2	45.5	4.0		55	53.6	291.8	2	2.2	4.0		45	60.0	291.7	6	44.6	3.8		35	53.9	291.4	11	12.0	3.6	
40	90	55.5		-11	54.4			80	36.8		-7	25.2			70	36.9		-2	41.5			60	45.4		2	6.2			50	51.7		6	48.5			40	45.3		11	15.6		
17 0	95	46.7		-11	50.8			85	28.4		-7	21.3			75	28.7		-2	37.6			65	37.2		2	10.2			55	43.4		6	52.3			45	36.8		11	19.2		
20	100	37.9	291.2	-11	47.2	3.6		90	19.9	291.6	-7	17.4	3.9		80	20.4	291.8	-2	33.6	4.0		70	29.0	291.8	2	14.2	4.0		60	35.0	291.7	6	56.1	3.8		50	28.2	291.4	11	22.7	3.5	
40	105	29.2		-11	43.6			95	11.5		-7	13.6			85	12.2		-2	29.6			75	20.8		2	18.2			65	26.7		6	59.9			55	19.6		11	26.3		
18 0	110	20.4		-11	40.0			100	3.1		-7	9.7			90	4.0		-2	25.6			80	12.6		2	22.1			70	18.4		7	3.8			60	11.1		11	29.8		
20	115	11.7	291.3	-11	36.4	3.6		104	54.7	291.6	-7	5.8	3.9		94	55.7	291.8	-2	21.6	4.0		85	4.4	291.8	2	26.1	4.0		75	10.1	291.7	7	7.6	3.8		65	2.5	291.4	11	33.3	3.5	
40	120	3.0		-11	32.8			109	46.3		-7	1.9			99	47.5		-2	17.6			89	56.2		2	30.1			80	1.8		7	11.4			69	53.9		11	36.9		
19 0	124	54.2		-11	29.2			114	37.8		-6	58.0			104	39.2		-2	13.6			94	48.0		2	34.1			84	53.4		7	15.2			74	45.3		11	40.4		
20	129	45.5	291.3	-11	25.5	3.6		119	29.4	291.6	-6	54.2	3.9		109	31.0	291.8	-2	9.6	4.0		99	39.8	291.8	2	38.0	4.0		89	45.1	291.7	7	19.1	3.8		79	36.8	291.4	11	43.9	3.5	
40	134	36.8		-11	21.9			124	21.0		-6	50.3			114	22.8		-2	5.6			104	31.5		2	42.0			94	36.8		7	22.9			84	28.2		11	47.5		
20 0	139	28.1		-11	18.3			129	12.6		-6	46.4			119	14.5		-2	1.6			109	23.3		2	46.0			99	28.4		7	26.7			89	19.6		11	51.0		
20	144	19.3	291.3	-11	14.6	3.7		134	4.2	291.6	-6	42.5	3.9		124	6.3	291.8	-1	57.6	4.0		114	15.1	291.8	2	49.9	4.0		104	20.1	291.7	7	30.5	3.8		94	11.0	291.4	11	54.5	3.5	
40	149	10.6		-11	11.0			138	55.8		-6	38.6			128	58.1		-1	53.6			119	6.9		2	53.9			109	11.8		7	34.3			99	2.4		11	58.0		
21 0	154	1.9		-11	7.3			143	47.4		-6	34.7			133	49.8		-1	49.6			123	58.7		2	57.9			114	3.4		7	38.1			103	53.8		12	1.5		
20	158	53.2	291.3	-11	3.7	3.6		148	39.0	291.6	-6	30.8	3.9		138	41.6	291.8	-1	45.6	4.0		128	50.5	291.8	3	1.8	4.0		118	55.1	291.7	7	41.9	3.8		108	45.1	291.4	12	5.0	3.5	
40	163	44.5		-11	0.0			153	30.6		-6	26.9			143	33.4		-1	41.6			133	42.3		3	5.8			123	46.7		7	45.7			113	36.5		12	8.5		
22 0	168	35.9		-10	56.4			158	22.2		-6	23.0			148	25.1		-1	37.6			138	34.0		3	9.8			128	38.4		7	49.5			118	27.9		12	11.9		
20	173	27.2	291.3	-10	52.7	3.7		163	13.9	291.6	-6	19.1	3.9		153	16.9	291.8	-1	33.6	4.0		143	25.8	291.8	3	13.7	3.9		133	30.0	291.6	7	53.2	3.8		123	19.3	291.4	12	15.4	3.5	
40	178	18.5		-10	49.0			168	5.5		-6	15.2			158	8.7		-1	29.6			148	17.6		3	17.7			138	21.7		7	57.0			128	10.6		12	18.9		
23 0	183	9.8		-10	45.4			172	57.1		-6	11.3			163	0.5		-1	25.6			153	9.4		3	21.6			143	13.3		8	0.8			133	2.0		12	22.4		
20	188	1.2	291.3	-10	41.7	3.7		177	48.7	291.6	-6	7.4	3.9		167	52.2	291.8	-1	21.6	4.0		158	1.2	291.8	3	25.6	4.0		148	4.9	291.6	8	4.6	3.8		137	53.3	291.4	12	25.8	3.4	
40	192	52.5		-10	38.0			182	40.4		-6	3.5			172	44.0		-1	17.6			162	53.0		3	29.5			152	56.6		8	8.4			142	44.7		12	29.3		

2011 Moon

	8 Mar					9 Mar					10 Mar					11 Mar					12 Mar					13 Mar				
	GHA			Dec		GHA			Dec		GHA			Dec		GHA			Dec		GHA			Dec		GHA			Dec	
h m	o	'	d	o	'	o	'	d	o	'	o	'	d	o	'	o	'	d	o	'	o	'	d	o	'	o	'	d	o	'
0 0	147	36.0	291.3	12	32.7	136	59.0	290.9	16	25.5	125	49.8	290.4	19	40.0	114	4.0	289.9	22	5.3	101	42.1	289.5	23	30.6	88	49.7	289.1	23	46.3
20	152	27.4		12	36.2	141	50.0		16	28.5	130	40.2		19	42.3	118	53.9		22	6.9	106	31.5		23	31.3	93	38.8		23	45.9
40	157	18.7		12	39.6	146	40.9		16	31.4	135	30.7		19	44.7	123	43.9		22	8.5	111	21.0		23	32.0	98	27.9		23	45.6
1 0	162	10.1	291.3	12	43.1	151	31.8	290.9	16	34.4	140	21.1	290.4	19	47.1	128	33.8	289.9	22	10.1	116	10.4	289.4	23	32.7	103	17.0	289.1	23	45.3
20	167	1.4		12	46.5	156	22.8		16	37.4	145	11.5		19	49.4	133	23.7		22	11.7	120	59.9		23	33.4	108	6.0		23	44.9
40	171	52.7		12	49.9	161	13.7		16	40.3	150	2.0		19	51.8	138	13.6		22	13.3	125	49.3		23	34.1	112	55.1		23	44.6
2 0	176	44.0	291.3	12	53.3	166	4.6	290.9	16	43.3	154	52.4	290.4	19	54.1	143	3.5	289.9	22	14.8	130	38.7	289.4	23	34.7	117	44.2	289.1	23	44.2
20	181	35.3		12	56.8	170	55.5		16	46.2	159	42.8		19	56.4	147	53.4		22	16.4	135	28.2		23	35.3	122	33.3		23	43.8
40	186	26.7		13	0.2	175	46.4		16	49.2	164	33.2		19	58.7	152	43.3		22	17.9	140	17.6		23	36.0	127	22.4		23	43.4
3 0	191	18.0	291.3	13	3.6	180	37.3	290.9	16	52.1	169	23.6	290.4	20	1.0	157	33.2	289.9	22	19.4	145	7.0	289.4	23	36.6	132	11.4	289.1	23	42.9
20	196	9.3		13	7.0	185	28.1		16	55.0	174	14.0		20	3.3	162	23.1		22	21.0	149	56.4		23	37.2	137	0.5		23	42.5
40	201	0.5		13	10.4	190	19.0		16	57.9	179	4.4		20	5.6	167	12.9		22	22.5	154	45.8		23	37.7	141	49.6		23	42.0
4 0	205	51.8	291.3	13	13.7	195	9.9	290.9	17	0.8	183	54.7	290.4	20	7.9	172	2.8	289.8	22	24.0	159	35.2	289.4	23	38.3	146	38.6	289.1	23	41.5
20	210	43.1		13	17.1	200	0.8		17	3.7	188	45.1		20	10.2	176	52.6		22	25.4	164	24.6		23	38.8	151	27.7		23	41.1
40	215	34.4		13	20.5	204	51.6		17	6.6	193	35.5		20	12.4	181	42.5		22	26.9	169	14.0		23	39.4	156	16.8		23	40.5
5 0	220	25.7	291.3	13	23.9	209	42.5	290.8	17	9.5	198	25.8	290.3	20	14.6	186	32.3	289.8	22	28.4	174	3.4	289.4	23	39.9	161	5.8	289.0	23	40.0
20	225	16.9		13	27.2	214	33.3		17	12.4	203	16.2		20	16.9	191	22.1		22	29.8	178	52.7		23	40.4	165	54.9		23	39.5
40	230	8.2		13	30.6	219	24.1		17	15.2	208	6.5		20	19.1	196	12.0		22	31.2	183	42.1		23	40.9	170	43.9		23	38.9
6 0	234	59.5	291.2	13	33.9	224	15.0	290.8	17	18.1	212	56.8	290.3	20	21.3	201	1.8	289.8	22	32.6	188	31.5	289.4	23	41.4	175	32.9	289.0	23	38.4
20	239	50.7		13	37.3	229	5.8		17	21.0	217	47.2		20	23.5	205	51.6		22	34.1	193	20.8		23	41.9	180	22.0		23	37.8
40	244	42.0		13	40.6	233	56.6		17	23.8	222	37.5		20	25.7	210	41.4		22	35.5	198	10.2		23	42.3	185	11.0		23	37.2
7 0	249	33.2	291.2	13	44.0	238	47.4	290.8	17	26.6	227	27.8	290.3	20	27.9	215	31.2	289.8	22	36.8	202	59.5	289.3	23	42.8	190	0.1	289.0	23	36.6
20	254	24.4		13	47.3	243	38.2		17	29.5	232	18.1		20	30.1	220	21.0		22	38.2	207	48.9		23	43.2	194	49.1		23	36.0
40	259	15.7		13	50.6	248	29.0		17	32.3	237	8.4		20	32.2	225	10.8		22	39.6	212	38.2		23	43.6	199	38.1		23	35.3
8 0	264	6.9	291.2	13	53.9	253	19.8	290.8	17	35.1	241	58.7	290.3	20	34.4	230	0.5	289.8	22	40.9	217	27.5	289.3	23	44.0	204	27.1	289.0	23	34.7
20	268	58.1		13	57.2	258	10.6		17	37.9	246	48.9		20	36.5	234	50.3		22	42.2	222	16.9		23	44.4	209	16.2		23	34.0
40	273	49.3		14	0.5	263	1.4		17	40.7	251	39.2		20	38.7	239	40.1		22	43.6	227	6.2		23	44.7	214	5.2		23	33.3
9 0	278	40.5	291.2	14	3.8	267	52.2	290.8	17	43.5	256	29.5	290.3	20	40.8	244	29.8	289.7	22	44.9	231	55.5	289.3	23	45.1	218	54.2	289.0	23	32.6
20	283	31.7		14	7.1	272	42.9		17	46.2	261	19.7		20	42.9	249	19.6		22	46.2	236	44.8		23	45.4	223	43.2		23	31.9
40	288	22.9		14	10.4	277	33.7		17	49.0	266	10.0		20	45.0	254	9.3		22	47.5	241	34.1		23	45.8	228	32.2		23	31.2
10 0	293	14.1	291.2	14	13.7	282	24.4	290.7	17	51.8	271	0.2	290.2	20	47.1	258	59.1	289.7	22	48.7	246	23.4	289.3	23	46.1	233	21.2	289.0	23	30.4
20	298	5.3		14	17.0	287	15.2		17	54.5	275	50.5		20	49.2	263	48.8		22	50.0	251	12.7		23	46.4	238	10.2		23	29.7
40	302	56.5		14	20.2	292	5.9		17	57.3	280	40.7		20	51.3	268	38.5		22	51.2	256	2.0		23	46.7	242	59.2		23	28.9
11 0	307	47.7	291.2	14	23.5	296	56.6	290.7	18	0.0	285	30.9	290.2	20	53.3	273	28.2	289.7	22	52.5	260	51.3	289.3	23	46.9	247	48.2	289.0	23	28.1
20	312	38.8		14	26.7	301	47.4		18	2.7	290	21.1		20	55.4	278	17.9		22	53.7	265	40.6		23	47.2	252	37.2		23	27.3
40	317	30.0		14	30.0	306	38.1		18	5.5	295	11.4		20	57.4	283	7.6		22	54.9	270	29.8		23	47.4	257	26.2		23	26.5
12 0	322	21.2	291.1	14	33.2	311	28.8	290.7	18	8.2	300	1.6	290.2	20	59.4	287	57.3	289.7	22	56.1	275	19.1	289.3	23	47.7	262	15.2	289.0	23	25.6
20	327	12.3		14	36.5	316	19.5		18	10.9	304	51.7		21	1.5	292	47.0		22	57.3	280	8.4		23	47.9	267	4.2		23	24.8
40	332	3.5		14	39.7	321	10.2		18	13.6	309	41.9		21	3.5	297	36.7		22	58.5	284	57.6		23	48.1	271	53.1		23	23.9
13 0	336	54.6	291.1	14	42.9	326	0.9	290.7	18	16.3	314	32.1	290.2	21	5.5	302	26.4	289.7	22	59.6	289	46.9	289.2	23	48.3	276	42.1	289.0	23	23.0
20	341	45.7		14	46.1	330	51.6		18	18.9	319	22.3		21	7.5	307	16.0		23	0.8	294	36.1		23	48.4	281	31.1		23	22.1
40	346	36.9		14	49.3	335	42.2		18	21.6	324	12.5		21	9.4	312	5.7		23	1.9	299	25.4		23	48.6	286	20.1		23	21.2
14 0	351	28.0	291.1	14	52.5	340	32.9	290.7	18	24.3	329	2.6	290.1	21	11.4	316	55.4	289.6	23	3.0	304	14.6	289.2	23	48.7	291	9.1	289.0	23	20.3
20	356	19.1		14	55.7	345	23.6		18	26.9	333	52.8		21	13.4	321	45.0		23	4.1	309	3.8		23	48.9	295	58.0		23	19.3
40	1	10.2		14	58.9	350	14.2		18	29.6	338	42.9		21	15.3	326	34.6		23	5.2	313	53.1		23	49.0	300	47.0		23	18.4
15 0	6	1.3	291.1	15	2.1	355	4.9	290.6	18	32.2	343	33.0	290.1	21	17.2	331	24.3	289.6	23	6.3	318	42.3	289.2	23	49.1	305	36.0	289.0	23	17.4
20	10	52.5		15	5.3	359	55.5		18	34.8	348	23.2		21	19.2	336	13.9		23	7.4	323	31.5		23	49.2	310	24.9		23	16.4
40	15	43.6		15	8.5	4	46.2		18	37.4	353	13.3		21	21.1	341	3.5		23	8.4	328	20.7		23	49.2	315	13.9		23	15.4
16 0	20	34.6	291.1	15	11.6	9	36.8	290.6	18	40.0	358	3.4	290.1	21	23.0	345	53.2	289.6	23	9.5	333	9.9	289.2	23	49.3	320	2.8	289.0	23	14.4
20	25	25.7		15	14.8	14	27.4		18	42.6	2	53.5		21	24.9	350	42.8		23	10.5	337	59.1		23	49.3	324	51.8		23	13.3
40	30	16.8		15	17.9	19	18.0		18	45.2	7	43.6		21	26.8	355	32.4		23	11.5	342	48.3		23	49.4	329	40.7		23	12.3
17 0	35	7.9	291.1	15	21.1	24	8.6	290.6	18	47.8	12	33.7	290.1	21	28.6	0	22.0	289.6	23	12.5	347	37.5	289.2	23	49.4	334	29.7	288.9	23	11.2
20	39	58.9		15	24.2	28	59.2		18	50.4	17	23.8		21	30.5	5	11.6		23	13.5	352	26.7		23	49.4	339	18.6		23	10.1
40	44	50.0		15	27.3	33	49.8		18	53.0	22	13.9		21	32.3	10	1.1		23	14.5	357	15.9		23	49.4	344	7.6		23	9.0
18 0	49	41.1	291.0	15	30.5	38	40.4	290.6	18	55.5	27	3.9	290.1	21	34.2	14	50.7	289.6	23	15.5	2	5.1	289.2	23	49.3	348	56.5	288.9	23	7.9
20	54	32.1		15	33.6	43	31.0		18	58.1	31	54.0		21	36.0	19	40.3		23	16.4	6	54.3		23	49.3	353	45.5		23	6.8
40	59	23.2		15	36.7	48	21.6		19	0.6	36	44.1		21	37.8	24	29.9		23	17.4	11	43.5		23	49.2	358	34.4		23	5.7
19 0	64	14.2	291.0	15	39.8	53	12.1	290.6	19	3.1	41	34.1	290.0	21	39.6	29	19.4	289.5	23	18.3	16	32.6	289.2	23	49.1	3	23.4	288.9	23	4.5
20	69	5.2		15	42.9	58	2.7		19	5.6	46	24.2		21	41.4	34	9.0		23	19.2	21	21.8		23	49.1	8	12.3		23	3.3
40	73	56.3		15	46.0	62	53.2		19	8.2	51	14.2		21	43.2	38	58.5		23	20.1	26	10.9		23	48.9	13	1.2		23	2.1
20 0	78	47.3	291.0	15	49.1	67	43.8	290.5	19	10.7	56	4.2	290.0	21	44.9	43	48.1	289.5	23	21.0	31	0.1	289.1	23	48.8	17	50.2	288.9	23	0.9
20	83	38.3		15	52.1	72	34.3		19	13.1	60	54.2		21	46.7	48	37.6		23	21.9	35	49.3		23	48.7	22	39.1		22	59.7
40	88	29.3		15	55.2	77	24.9		19	15.6	65	44.3		21	48.4	53	27.1		23	22.7	40	38.4		23	48.5	27	28.0		22	58.5
21 0	93	20.3	291.0	15	58.3	82	15.4	290.5	19	18.1	70	34.3	290.0	21	50.2	58	16.6	289.5	23	23.6	45	27.5	289.1	23	48.4	32	17.0	288.9	22	57.2
20	98	11.3		16	1.3	87	5.9		19	20.6	75	24.3		21	51.9	63	6.2		23	24.4	50	16.7		23	48.2	37	5.9		22	56.0
40	103	2.3		16	4.4	91	56.4		19	23.0	80	14.3		21	53.6	67	55.7		23	25.2	55	5.8		23	48.0	41	54.8		22	54.7
22 0	107	53.3	291.0	16	7.4	96	46.9	290.5	19	25.5	85	4.2	290.0	21	55.3	72	45.2	289.5	23	26.0	59	55.0	289.1	23	47.8	46	43.7	288.9	22	53.4
20	112	44.2		16	10.4	101	37.4		19	27.9	89	54.2		21	57.0	77	34.7		23	26.8	64	44.1		23	47.6	51	32.7		22	52.1
40	117	35.2		16	13.5	106	27.9		19	30.3	94	44.2		21	58.7	82	24.2		23	27.6	69	33.2		23	47.3	56	21.6		22	50.7
23 0	122	26.2	291.0	16	16.5	111	18.4	290.5	19	32.8	99	34.2	289.9	22	0.4	87	13.6	289.5	23	28.4	74	22.3	289.1	23	47.1	61	10.5	288.9	22	49.4
20	127	17.1		16	19.5	116	8.8		19	35.2	104	24.1		22	2.0	92	3.1		23	29.1	79	11.4		23	46.8	65	59.4		22	48.0
40	132	8.1		16	22.5	120	59.3		19	37.6	109	14.1		22	3.6	96	52.6		23	29.9	84	0.5		23	46.6	70	48.3		22	46.7

2011 Moon

h m	14 Mar GHA ° ′	d	Dec ° ′	d′	15 Mar GHA ° ′	d	Dec ° ′	d′	16 Mar GHA ° ′	d	Dec ° ′	d′	17 Mar GHA ° ′	d	Dec ° ′	d′	18 Mar GHA ° ′	d	Dec ° ′	d′	19 Mar GHA ° ′	d	Dec ° ′	d′
0 0	75 37.2	288.9	22 45.3	-1.4	62 17.3	288.9	20 25.2	-2.5	49 0.5	289.0	16 49.5	-3.5	35 52.4	289.1	12 7.5	-4.3	22 52.5	289.2	6 35.0	-4.9	9 55.0	289.2	0 32.7	-5.1
20	80 26.2		22 43.9		67 6.2		20 22.7		53 49.5		16 46.0		40 41.5		12 3.2		27 41.7		6 30.1		14 44.2		0 27.6	
40	85 15.1		22 42.4		71 55.1		20 20.2		58 38.5		16 42.5		45 30.6		11 58.9		32 30.9		6 25.2		19 33.3		0 22.4	
1 0	90 4.0	288.9	22 41.0	-1.5	76 44.0	288.9	20 17.7	-2.5	63 27.4	289.0	16 38.9	-3.5	50 19.7	289.1	11 54.5	-4.3	37 20.1	289.2	6 20.3	-4.9	24 22.5	289.2	0 17.3	-5.1
20	94 52.9		22 39.6		81 32.9		20 15.2		68 16.4		16 35.4		55 8.9		11 50.2		42 9.3		6 15.4		29 11.7		0 12.2	
40	99 41.8		22 38.1		86 21.8		20 12.6		73 5.4		16 31.9		59 58.0		11 45.9		46 58.5		6 10.5		34 0.9		0 7.0	
2 0	104 30.7	288.9	22 36.6	-1.5	91 10.7	288.9	20 10.1	-2.6	77 54.4	289.0	16 28.3	-3.6	64 47.1	289.1	11 41.5	-4.4	51 47.7	289.2	6 5.6	-4.9	38 50.0	289.2	0 1.9	-5.1
20	109 19.6		22 35.1		95 59.6		20 7.5		82 43.4		16 24.8		69 36.3		11 37.1		56 36.9		6 0.7		43 39.2		-0 3.2	
40	114 8.5		22 33.6		100 48.5		20 4.9		87 32.4		16 21.2		74 25.4		11 32.7		61 26.1		5 55.8		48 28.4		-0 8.4	
3 0	118 57.4	288.9	22 32.1	-1.6	105 37.4	288.9	20 2.3	-2.6	92 21.4	289.0	16 17.6	-3.6	79 14.5	289.1	11 28.3	-4.4	66 15.3	289.2	5 50.9	-5.0	53 17.5	289.2	-0 13.5	-5.1
20	123 46.3		22 30.5		110 26.3		19 59.6		97 10.4		16 14.0		84 3.7		11 23.9		71 4.5		5 45.9		58 6.7		-0 18.6	
40	128 35.2		22 29.0		115 15.2		19 57.0		101 59.4		16 10.4		88 52.8		11 19.5		75 53.7		5 41.0		62 55.9		-0 23.8	
4 0	133 24.1	288.9	22 27.4	-1.6	120 4.1	288.9	19 54.4	-2.7	106 48.5	289.0	16 6.7	-3.6	93 41.9	289.1	11 15.1	-4.4	80 42.9	289.2	5 36.0	-4.9	67 45.0	289.2	-0 28.9	-5.1
20	138 13.0		22 25.8		124 53.0		19 51.7		111 37.5		16 3.1		98 31.1		11 10.7		85 32.2		5 31.1		72 34.2		-0 34.0	
40	143 1.9		22 24.2		129 41.9		19 49.0		116 26.5		15 59.4		103 20.2		11 6.2		90 21.4		5 26.2		77 23.3		-0 39.2	
5 0	147 50.8	288.9	22 22.6	-1.7	134 30.8	288.9	19 46.3	-2.7	121 15.5	289.0	15 55.8	-3.7	108 9.3	289.1	11 1.8	-4.5	95 10.6	289.2	5 21.2	-5.0	82 12.5	289.2	-0 44.3	-5.1
20	152 39.7		22 21.0		139 19.7		19 43.6		126 4.5		15 52.1		112 58.5		10 57.3		99 59.8		5 16.2		87 1.7		-0 49.4	
40	157 28.6		22 19.3		144 8.6		19 40.9		130 53.5		15 48.4		117 47.6		10 52.9		104 49.0		5 11.3		91 50.8		-0 54.6	
6 0	162 17.5	288.9	22 17.6	-1.7	148 57.5	288.9	19 38.1	-2.8	135 42.5	289.0	15 44.7	-3.7	122 36.8	289.1	10 48.4	-4.5	109 38.2	289.2	5 6.3	-5.0	96 40.0	289.1	-0 59.7	-5.1
20	167 6.4		22 16.0		153 46.4		19 35.4		140 31.6		15 41.0		127 25.9		10 43.9		114 27.4		5 1.3		101 29.1		-1 4.8	
40	171 55.3		22 14.3		158 35.3		19 32.6		145 20.6		15 37.2		132 15.1		10 39.4		119 16.6		4 56.3		106 18.3		-1 10.0	
7 0	176 44.2	288.9	22 12.6	-1.8	163 24.2	288.9	19 29.8	-2.8	150 9.6	289.0	15 33.5	-3.8	137 4.2	289.2	10 34.9	-4.5	124 5.8	289.2	4 51.4	-5.0	111 7.4	289.1	-1 15.1	-5.1
20	181 33.1		22 10.8		168 13.1		19 27.0		154 58.6		15 29.7		141 53.4		10 30.4		128 55.0		4 46.4		115 56.6		-1 20.2	
40	186 22.0		22 9.1		173 2.0		19 24.2		159 47.7		15 26.0		146 42.5		10 25.9		133 44.2		4 41.4		120 45.7		-1 25.4	
8 0	191 10.8	288.9	22 7.3	-1.8	177 50.9	288.9	19 21.4	-2.9	164 36.7	289.0	15 22.2	-3.8	151 31.7	289.2	10 21.4	-4.6	138 33.4	289.2	4 36.4	-5.0	125 34.8	289.1	-1 30.5	-5.1
20	195 59.7		22 5.6		182 39.9		19 18.5		169 25.7		15 18.4		156 20.9		10 16.8		143 22.7		4 31.4		130 24.0		-1 35.6	
40	200 48.6		22 3.8		187 28.8		19 15.7		174 14.8		15 14.6		161 10.0		10 12.3		148 11.9		4 26.4		135 13.1		-1 40.8	
9 0	205 37.5	288.9	22 2.0	-1.8	192 17.7	288.9	19 12.8	-2.9	179 3.8	289.0	15 10.8	-3.8	165 59.2	289.2	10 7.7	-4.6	153 1.1	289.2	4 21.4	-5.0	140 2.3	289.1	-1 45.9	-5.1
20	210 26.4		22 0.2		197 6.6		19 9.9		183 52.8		15 7.0		170 48.3		10 3.2		157 50.3		4 16.3		144 51.4		-1 51.0	
40	215 15.3		21 58.3		201 55.5		19 7.0		188 41.9		15 3.1		175 37.5		9 58.6		162 39.5		4 11.3		149 40.5		-1 56.1	
10 0	220 4.2	288.9	21 56.5	-1.9	206 44.5	288.9	19 4.1	-2.9	193 30.9	289.0	14 59.3	-3.9	180 26.7	289.2	9 54.0	-4.6	167 28.7	289.2	4 6.3	-5.0	154 29.7	289.1	-2 1.3	-5.1
20	224 53.0		21 54.6		211 33.4		19 1.2		198 20.0		14 55.4		185 15.8		9 49.4		172 17.9		4 1.3		159 18.8		-2 6.4	
40	229 41.9		21 52.7		216 22.3		18 58.3		203 9.0		14 51.5		190 5.0		9 44.8		177 7.1		3 56.2		164 7.9		-2 11.5	
11 0	234 30.8	288.9	21 50.8	-1.9	221 11.2	288.9	18 55.3	-3.0	207 58.1	289.1	14 47.6	-3.9	194 54.2	289.2	9 40.2	-4.6	181 56.3	289.2	3 51.2	-5.0	168 57.0	289.1	-2 16.6	-5.1
20	239 19.7		21 48.9		226 0.2		18 52.3		212 47.1		14 43.8		199 43.3		9 35.6		186 45.5		3 46.2		173 46.2		-2 21.8	
40	244 8.6		21 47.0		230 49.1		18 49.4		217 36.2		14 39.8		204 32.5		9 31.0		191 34.7		3 41.1		178 35.3		-2 26.9	
12 0	248 57.5	288.9	21 45.1	-2.0	235 38.0	288.9	18 46.4	-3.0	222 25.2	289.1	14 35.9	-3.9	209 21.7	289.2	9 26.4	-4.6	196 23.9	289.2	3 36.1	-5.1	183 24.4	289.1	-2 32.0	-5.1
20	253 46.4		21 43.1		240 26.9		18 43.4		227 14.3		14 32.0		214 10.8		9 21.8		201 13.2		3 31.0		188 13.5		-2 37.1	
40	258 35.2		21 41.1		245 15.9		18 40.3		232 3.3		14 28.1		219 0.0		9 17.1		206 2.4		3 26.0		193 2.6		-2 42.2	
13 0	263 24.1	288.9	21 39.2	-2.0	250 4.8	288.9	18 37.3	-3.1	236 52.4	289.1	14 24.1	-4.0	223 49.2	289.2	9 12.5	-4.7	210 51.6	289.2	3 20.9	-5.0	197 51.7	289.1	-2 47.3	-5.1
20	268 13.0		21 37.2		254 53.7		18 34.2		241 41.5		14 20.1		228 38.4		9 7.8		215 40.8		3 15.9		202 40.9		-2 52.5	
40	273 1.9		21 35.1		259 42.7		18 31.2		246 30.5		14 16.2		233 27.5		9 3.1		220 30.0		3 10.8		207 30.0		-2 57.6	
14 0	277 50.8	288.9	21 33.1	-2.1	264 31.6	288.9	18 28.1	-3.1	251 19.6	289.1	14 12.2	-4.0	238 16.7	289.2	8 58.5	-4.7	225 19.2	289.2	3 5.8	-5.1	212 19.1	289.1	-3 2.7	-5.1
20	282 39.6		21 31.1		269 20.6		18 25.0		256 8.7		14 8.2		243 5.9		8 53.8		230 8.4		3 0.7		217 8.2		-3 7.8	
40	287 28.5		21 29.0		274 9.5		18 21.9		260 57.7		14 4.2		247 55.1		8 49.1		234 57.6		2 55.6		221 57.3		-3 12.9	
15 0	292 17.4	288.9	21 26.9	-2.1	278 58.4	288.9	18 18.8	-3.2	265 46.8	289.1	14 0.1	-4.0	252 44.3	289.2	8 44.4	-4.7	239 46.8	289.2	2 50.5	-5.1	226 46.4	289.1	-3 18.0	-5.1
20	297 6.3		21 24.8		283 47.4		18 15.6		270 35.9		13 56.1		257 33.4		8 39.7		244 36.0		2 45.5		231 35.5		-3 23.1	
40	301 55.2		21 22.7		288 36.3		18 12.5		275 24.9		13 52.1		262 22.6		8 35.0		249 25.2		2 40.4		236 24.6		-3 28.2	
16 0	306 44.1	288.9	21 20.6	-2.1	293 25.3	289.0	18 9.3	-3.2	280 14.0	289.1	13 48.0	-4.1	267 11.8	289.2	8 30.3	-4.7	254 14.4	289.2	2 35.3	-5.1	241 13.7	289.1	-3 33.3	-5.1
20	311 32.9		21 18.5		298 14.2		18 6.2		285 3.1		13 43.9		272 1.0		8 25.5		259 3.6		2 30.2		246 2.7		-3 38.4	
40	316 21.8		21 16.3		303 3.2		18 3.0		289 52.2		13 39.9		276 50.2		8 20.8		263 52.8		2 25.1		250 51.8		-3 43.5	
17 0	321 10.7	288.9	21 14.2	-2.2	307 52.1	289.0	17 59.8	-3.2	294 41.3	289.1	13 35.8	-4.1	281 39.4	289.2	8 16.1	-4.8	268 42.0	289.2	2 20.0	-5.1	255 40.9	289.1	-3 48.6	-5.1
20	325 59.6		21 12.0		312 41.1		17 56.6		299 30.3		13 31.7		286 28.6		8 11.3		273 31.2		2 15.0		260 30.0		-3 53.6	
40	330 48.5		21 9.8		317 30.0		17 53.3		304 19.4		13 27.6		291 17.7		8 6.6		278 20.4		2 9.9		265 19.1		-3 58.7	
18 0	335 37.4	288.9	21 7.6	-2.2	322 19.0	289.0	17 50.1	-3.3	309 8.5	289.1	13 23.5	-4.2	296 6.9	289.2	8 1.8	-4.8	283 9.6	289.2	2 4.8	-5.1	270 8.1	289.1	-4 3.8	-5.1
20	340 26.2		21 5.4		327 7.9		17 46.8		313 57.6		13 19.3		300 56.1		7 57.0		287 58.8		1 59.7		274 57.2		-4 8.9	
40	345 15.1		21 3.1		331 56.9		17 43.6		318 46.7		13 15.2		305 45.3		7 52.3		292 48.0		1 54.6		279 46.3		-4 14.0	
19 0	350 4.0	288.9	21 0.9	-2.3	336 45.9	289.0	17 40.3	-3.3	323 35.8	289.1	13 11.0	-4.2	310 34.5	289.2	7 47.5	-4.8	297 37.2	289.2	1 49.5	-5.1	284 35.4	289.1	-4 19.0	-5.1
20	354 52.9		20 58.6		341 34.8		17 37.0		328 24.9		13 6.9		315 23.7		7 42.7		302 26.4		1 44.4		289 24.4		-4 24.1	
40	359 41.8		20 56.3		346 23.8		17 33.7		333 14.0		13 2.7		320 12.9		7 37.9		307 15.6		1 39.2		294 13.5		-4 29.2	
20 0	4 30.7	288.9	20 54.0	-2.3	351 12.7	289.0	17 30.4	-3.4	338 3.1	289.1	12 58.5	-4.2	325 2.1	289.2	7 33.1	-4.8	312 4.8	289.2	1 34.1	-5.1	299 2.6	289.1	-4 34.2	-5.1
20	9 19.5		20 51.7		356 1.7		17 27.0		342 52.2		12 54.3		329 51.3		7 28.3		316 53.9		1 29.0		303 51.6		-4 39.3	
40	14 8.4		20 49.4		0 50.7		17 23.7		347 41.3		12 50.1		334 40.5		7 23.5		321 43.1		1 23.9		308 40.7		-4 44.3	
21 0	18 57.3	288.9	20 47.0	-2.4	5 39.7	289.0	17 20.3	-3.4	352 30.4	289.1	12 45.9	-4.2	339 29.7	289.2	7 18.7	-4.8	326 32.3	289.2	1 18.8	-5.1	313 29.7	289.0	-4 49.4	-5.0
20	23 46.2		20 44.6		10 28.6		17 16.9		357 19.5		12 41.7		344 18.9		7 13.8		331 21.5		1 13.7		318 18.8		-4 54.4	
40	28 35.1		20 42.3		15 17.6		17 13.5		2 8.6		12 37.4		349 8.1		7 9.0		336 10.7		1 8.6		323 7.8		-4 59.5	
22 0	33 24.0	288.9	20 39.9	-2.4	20 6.6	289.0	17 10.1	-3.4	6 57.7	289.1	12 33.2	-4.3	353 57.3	289.2	7 4.2	-4.9	340 59.9	289.2	1 3.4	-5.1	327 56.9	289.0	-5 4.5	-5.0
20	38 12.9		20 37.5		24 55.6		17 6.7		11 46.8		12 28.9		358 46.5		6 59.3		345 49.1		0 58.3		332 45.9		-5 9.6	
40	43 1.7		20 35.1		29 44.5		17 3.3		16 35.9		12 24.7		3 35.7		6 54.5		350 38.3		0 53.2		337 34.9		-5 14.6	
23 0	47 50.6	288.9	20 32.6	-2.5	34 33.5	289.0	16 59.9	-3.5	21 25.0	289.1	12 20.4	-4.3	8 24.9	289.2	6 49.6	-4.9	355 27.4	289.2	0 48.1	-5.1	342 24.0	289.0	-5 19.6	-5.0
20	52 39.5		20 30.2		39 22.5		16 56.4		26 14.1		12 16.1		13 14.1		6 44.7		0 16.6		0 42.9		347 13.0		-5 24.6	
40	57 28.4		20 27.7		44 11.5		16 52.9		31 3.3		12 11.8		18 3.3		6 39.9		5 5.8		0 37.8		352 2.0		-5 29.7	

2011 Moon

	20 Mar						21 Mar						22 Mar						23 Mar						24 Mar						25 Mar					
	GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec		
h m	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'
0 0	356	51.1	289.0	-5	34.7	-5.0	343	32.0	288.8	-11	20.7	-4.5	329	52.7	288.5	-16	19.9	-3.7	315	54.7	288.3	-20	11.1	-2.6	301	47.8	288.2	-22	40.0	-1.4	287	48.6	288.5	-23	41.2	-0.2
20	1	40.1		-5	39.7		348	20.8		-11	25.2		334	41.2		-16	23.6		320	42.9		-20	13.7		306	36.0		-22	41.5		292	37.1		-23	41.4	
40	6	29.1		-5	44.7		353	9.6		-11	29.7		339	29.7		-16	27.3		325	31.2		-20	16.4		311	24.3		-22	42.9		297	25.6		-23	41.6	
1 0	11	18.1	289.0	-5	49.7	-5.0	357	58.3	288.7	-11	34.3	-4.5	344	18.1	288.5	-16	31.0	-3.7	330	19.5	288.3	-20	19.0	-2.6	316	12.5	288.3	-22	44.3	-1.4	302	14.1	288.5	-23	41.8	-0.2
20	16	7.1		-5	54.7		2	47.1		-11	38.8		349	6.6		-16	34.7		335	7.7		-20	21.6		321	0.8		-22	45.7		307	2.6		-23	42.0	
40	20	56.1		-5	59.7		7	35.8		-11	43.3		353	55.1		-16	38.4		339	56.0		-20	24.2		325	49.1		-22	47.1		311	51.1		-23	42.2	
2 0	25	45.2	289.0	-6	4.7	-5.0	12	24.6	288.7	-11	47.7	-4.5	358	43.5	288.4	-16	42.0	-3.6	344	44.2	288.3	-20	26.8	-2.5	330	37.3	288.3	-22	48.5	-1.3	316	39.6	288.5	-23	42.4	-0.1
20	30	34.2		-6	9.7		17	13.3		-11	52.2		3	32.0		-16	45.7		349	32.5		-20	29.3		335	25.6		-22	49.8		321	28.2		-23	42.5	
40	35	23.2		-6	14.7		22	2.0		-11	56.7		8	20.4		-16	49.3		354	20.7		-20	31.9		340	13.8		-22	51.1		326	16.7		-23	42.6	
3 0	40	12.2	289.0	-6	19.6	-5.0	26	50.8	288.7	-12	1.1	-4.4	13	8.9	288.4	-16	52.9	-3.6	359	9.0	288.3	-20	34.4	-2.5	345	2.1	288.3	-22	52.5	-1.3	331	5.2	288.5	-23	42.7	-0.1
20	45	1.2		-6	24.6		31	39.5		-12	5.6		17	57.3		-16	56.5		3	57.2		-20	36.9		349	50.4		-22	53.8		335	53.7		-23	42.8	
40	49	50.2		-6	29.6		36	28.2		-12	10.0		22	45.7		-17	0.1		8	45.5		-20	39.4		354	38.6		-22	55.0		340	42.3		-23	42.9	
4 0	54	39.1	289.0	-6	34.5	-5.0	41	16.9	288.7	-12	14.4	-4.4	27	34.2	288.4	-17	3.7	-3.5	13	33.7	288.2	-20	41.9	-2.4	359	26.9	288.3	-22	56.3	-1.2	345	30.8	288.6	-23	43.0	0.0
20	59	28.1		-6	39.5		46	5.7		-12	18.9		32	22.6		-17	7.2		18	22.0		-20	44.3		4	15.2		-22	57.6		350	19.4		-23	43.0	
40	64	17.1		-6	44.5		50	54.4		-12	23.3		37	11.0		-17	10.8		23	10.2		-20	46.8		9	3.4		-22	58.8		355	7.9		-23	43.0	
5 0	69	6.1	289.0	-6	49.4	-4.9	55	43.1	288.7	-12	27.7	-4.4	41	59.5	288.4	-17	14.3	-3.5	27	58.5	288.2	-20	49.2	-2.4	13	51.7	288.3	-23	0.0	-1.2	359	56.5	288.6	-23	43.0	0.0
20	73	55.1		-6	54.3		60	31.8		-12	32.1		46	47.9		-17	17.8		32	46.7		-20	51.6		18	40.0		-23	1.2		4	45.1		-23	43.0	
40	78	44.0		-6	59.3		65	20.5		-12	36.4		51	36.3		-17	21.3		37	35.0		-20	54.0		23	28.3		-23	2.4		9	33.6		-23	43.0	
6 0	83	33.0	289.0	-7	4.2	-4.9	70	9.2	288.7	-12	40.8	-4.3	56	24.7	288.4	-17	24.8	-3.5	42	23.2	288.2	-20	56.4	-2.3	28	16.5	288.3	-23	3.5	-1.1	14	22.2	288.6	-23	43.0	0.1
20	88	22.0		-7	9.1		74	57.9		-12	45.2		61	13.1		-17	28.3		47	11.5		-20	58.8		33	4.8		-23	4.7		19	10.8		-23	42.9	
40	93	10.9		-7	14.1		79	46.6		-12	49.5		66	1.5		-17	31.7		51	59.7		-21	1.1		37	53.1		-23	5.8		23	59.4		-23	42.8	
7 0	97	59.9	289.0	-7	19.0	-4.9	84	35.2	288.7	-12	53.8	-4.3	70	49.9	288.4	-17	35.2	-3.4	56	47.9	288.2	-21	3.4	-2.3	42	41.4	288.3	-23	6.9	-1.1	28	48.0	288.6	-23	42.8	0.1
20	102	48.9		-7	23.9		89	23.9		-12	58.2		75	38.3		-17	38.6		61	36.2		-21	5.8		47	29.7		-23	8.0		33	36.6		-23	42.7	
40	107	37.8		-7	28.8		94	12.6		-13	2.5		80	26.7		-17	42.0		66	24.4		-21	8.1		52	18.0		-23	9.1		38	25.2		-23	42.5	
8 0	112	26.8	288.9	-7	33.7	-4.9	99	1.3	288.7	-13	6.8	-4.3	85	15.1	288.4	-17	45.4	-3.4	71	12.6	288.2	-21	10.3	-2.3	57	6.3	288.3	-23	10.2	-1.0	43	13.8	288.6	-23	42.4	0.2
20	117	15.7		-7	38.6		103	49.9		-13	11.1		90	3.5		-17	48.8		76	0.9		-21	12.6		61	54.6		-23	11.2		48	2.5		-23	42.3	
40	122	4.6		-7	43.5		108	38.6		-13	15.4		94	51.9		-17	52.2		80	49.1		-21	14.8		66	42.9		-23	12.2		52	51.1		-23	42.1	
9 0	126	53.6	288.9	-7	48.4	-4.9	113	27.3	288.7	-13	19.6	-4.3	99	40.3	288.4	-17	55.5	-3.3	85	37.3	288.2	-21	17.1	-2.2	71	31.2	288.3	-23	13.2	-1.0	57	39.7	288.6	-23	41.9	0.2
20	131	42.5		-7	53.2		118	15.9		-13	23.9		104	28.7		-17	58.9		90	25.6		-21	19.3		76	19.5		-23	14.2		62	28.4		-23	41.7	
40	136	31.5		-7	58.1		123	4.6		-13	28.2		109	17.0		-18	2.2		95	13.8		-21	21.5		81	7.8		-23	15.2		67	17.0		-23	41.5	
10 0	141	20.4	288.9	-8	3.0	-4.8	127	53.2	288.6	-13	32.4	-4.2	114	5.4	288.4	-18	5.5	-3.3	100	2.0	288.2	-21	23.7	-2.1	85	56.1	288.3	-23	16.2	-0.9	72	5.7	288.7	-23	41.3	0.3
20	146	9.3		-8	7.8		132	41.8		-13	36.6		118	53.8		-18	8.8		104	50.3		-21	25.8		90	44.4		-23	17.1		76	54.3		-23	41.0	
40	150	58.2		-8	12.7		137	30.5		-13	40.8		123	42.2		-18	12.1		109	38.5		-21	28.0		95	32.8		-23	18.0		81	43.0		-23	40.8	
11 0	155	47.1	288.9	-8	17.5	-4.8	142	19.1	288.6	-13	45.1	-4.2	128	30.5	288.4	-18	15.4	-3.2	114	26.7	288.2	-21	30.1	-2.1	100	21.1	288.3	-23	18.9	-0.9	86	31.7	288.7	-23	40.5	0.3
20	160	36.1		-8	22.3		147	7.8		-13	49.3		133	18.9		-18	18.6		119	15.0		-21	32.2		105	9.4		-23	19.8		91	20.3		-23	40.2	
40	165	25.0		-8	27.2		151	56.4		-13	53.4		138	7.2		-18	21.9		124	3.2		-21	34.3		109	57.7		-23	20.7		96	9.0		-23	39.9	
12 0	170	13.9	288.9	-8	32.0	-4.8	156	45.0	288.6	-13	57.6	-4.2	142	55.6	288.4	-18	25.1	-3.2	128	51.4	288.2	-21	36.4	-2.0	114	46.1	288.3	-23	21.5	-0.8	100	57.7	288.7	-23	39.6	0.4
20	175	2.8		-8	36.8		161	33.6		-14	1.8		147	44.0		-18	28.3		133	39.6		-21	38.5		119	34.4		-23	22.4		105	46.4		-23	39.2	
40	179	51.7		-8	41.6		166	22.2		-14	5.9		152	32.3		-18	31.5		138	27.9		-21	40.5		124	22.8		-23	23.2		110	35.1		-23	38.9	
13 0	184	40.6	288.9	-8	46.4	-4.8	171	10.8	288.6	-14	10.1	-4.1	157	20.7	288.3	-18	34.7	-3.1	143	16.1	288.2	-21	42.5	-2.0	129	11.1	288.3	-23	24.0	-0.8	115	23.8	288.7	-23	38.5	0.4
20	189	29.5		-8	51.2		175	59.4		-14	14.2		162	9.0		-18	37.8		148	4.3		-21	44.5		133	59.4		-23	24.8		120	12.5		-23	38.1	
40	194	18.4		-8	56.0		180	48.0		-14	18.3		166	57.3		-18	41.0		152	52.5		-21	46.5		138	47.8		-23	25.6		125	1.3		-23	37.7	
14 0	199	7.3	288.9	-9	0.8	-4.8	185	36.6	288.6	-14	22.4	-4.1	171	45.7	288.3	-18	44.1	-3.1	157	40.8	288.2	-21	48.5	-2.0	143	36.1	288.4	-23	26.3	-0.7	129	50.0	288.7	-23	37.3	0.4
20	203	56.1		-9	5.6		190	25.2		-14	26.5		176	34.0		-18	47.3		162	29.0		-21	50.5		148	24.5		-23	27.1		134	38.7		-23	36.9	
40	208	45.0		-9	10.3		195	13.8		-14	30.6		181	22.3		-18	50.4		167	17.2		-21	52.4		153	12.9		-23	27.8		139	27.5		-23	36.4	
15 0	213	33.9	288.9	-9	15.1	-4.7	200	2.4	288.6	-14	34.7	-4.0	186	10.7	288.3	-18	53.5	-3.0	172	5.5	288.2	-21	54.4	-1.9	158	1.2	288.4	-23	28.5	-0.7	144	16.2	288.8	-23	36.0	0.5
20	218	22.8		-9	19.9		204	51.0		-14	38.7		190	59.0		-18	56.5		176	53.7		-21	56.3		162	49.6		-23	29.2		149	5.0		-23	35.5	
40	223	11.6		-9	24.6		209	39.6		-14	42.8		195	47.3		-18	59.6		181	41.9		-21	58.2		167	38.0		-23	29.8		153	53.8		-23	35.0	
16 0	228	0.5	288.9	-9	29.3	-4.7	214	28.1	288.6	-14	46.8	-4.0	200	35.7	288.3	-19	2.6	-3.0	186	30.1	288.2	-22	0.0	-1.9	172	26.3	288.4	-23	30.5	-0.6	158	42.5	288.8	-23	34.5	0.5
20	232	49.3		-9	34.1		219	16.7		-14	50.8		205	24.0		-19	5.7		191	18.4		-22	1.9		177	14.7		-23	31.1		163	31.3		-23	34.0	
40	237	38.2		-9	38.8		224	5.3		-14	54.8		210	12.3		-19	8.7		196	6.6		-22	3.7		182	3.1		-23	31.8		168	20.1		-23	33.4	
17 0	242	27.1	288.8	-9	43.5	-4.7	228	53.8	288.6	-14	58.8	-4.0	215	0.6	288.3	-19	11.7	-3.0	200	54.8	288.2	-22	5.6	-1.8	186	51.5	288.4	-23	32.4	-0.6	173	8.9	288.8	-23	32.9	0.6
20	247	15.9		-9	48.2		233	42.4		-15	2.8		219	48.9		-19	14.7		205	43.0		-22	7.4		191	39.9		-23	32.9		177	57.7		-23	32.3	
40	252	4.7		-9	52.9		238	30.9		-15	6.8		224	37.2		-19	17.6		210	31.3		-22	9.2		196	28.3		-23	33.5		182	46.5		-23	31.7	
18 0	256	53.6	288.8	-9	57.6	-4.7	243	19.5	288.5	-15	10.8	-3.9	229	25.5	288.3	-19	20.6	-2.9	215	19.5	288.2	-22	10.9	-1.8	201	16.7	288.4	-23	34.1	-0.5	187	35.3	288.8	-23	31.1	0.6
20	261	42.4		-10	2.3		248	8.0		-15	14.7		234	13.8		-19	23.5		220	7.7		-22	12.7		206	5.1		-23	34.6		192	24.2		-23	30.5	
40	266	31.3		-10	7.0		252	56.6		-15	18.6		239	2.1		-19	26.5		224	56.0		-22	14.4		210	53.5		-23	35.1		197	13.0		-23	29.9	
19 0	271	20.1	288.8	-10	11.7	-4.6	257	45.1	288.5	-15	22.6	-3.9	243	50.4	288.3	-19	29.4	-2.9	229	44.2	288.2	-22	16.2	-1.7	215	41.9	288.4	-23	35.6	-0.5	202	1.8	288.9	-23	29.2	0.7
20	276	8.9		-10	16.3		262	33.7		-15	26.5		248	38.7		-19	32.3		234	32.4		-22	17.9		220	30.3		-23	36.1		206	50.7		-23	28.6	
40	280	57.7		-10	21.0		267	22.2		-15	30.4		253	27.0		-19	35.1		239	20.7		-22	19.6		225	18.7		-23	36.6		211	39.5		-23	27.9	
20 0	285	46.5	288.8	-10	25.6	-4.6	272	10.7	288.5	-15	34.3	-3.9	258	15.3	288.3	-19	38.0	-2.8	244	8.9	288.2	-22	21.2	-1.7	230	7.2	288.4	-23	37.0	-0.4	216	28.4	288.9	-23	27.2	0.7
20	290	35.4		-10	30.3		276	59.2		-15	38.1		263	3.6		-19	40.8		248	57.1		-22	22.9		234	55.6		-23	37.5		221	17.3		-23	26.5	
40	295	24.2		-10	34.9		281	47.7		-15	42.0		267	51.9		-19	43.7		253	45.4		-22	24.5		239	44.0		-23	37.9		226	6.1		-23	25.8	
21 0	300	13.0	288.8	-10	39.5	-4.6	286	36.3	288.5	-15	45.9	-3.8	272	40.2	288.3	-19	46.5	-2.8	258	33.6	288.2	-22	26.2	-1.6	244	32.5	288.4	-23	38.3	-0.4	230	55.0	288.9	-23	25.1	0.8
20	305	1.8		-10	44.1		291	24.8		-15	49.7		277	28.5		-19	49.3		263	21.8		-22	27.8		249	20.9		-23	38.7		235	43.9		-23	24.3	
40	309	50.6		-10	48.7		296	13.3		-15	53.5		282	16.8		-19	52.1		268	10.1		-22	29.4		254	9.4		-23	39.1		240	32.8		-23	23.5	
22 0	314	39.4	288.8	-10	53.3	-4.6	301	1.8	288.5	-15	57.3	-3.8	287	5.0	288.3	-19	54.8	-2.7	272	58.3	288.2	-22	30.9	-1.5	258	57.8	288.5	-23	39.4	-0.3	245	21.7	288.9	-23	22.8	0.8
20	319	28.1		-10	57.9		305	50.3		-16	1.1		291	53.3		-19	57.6		277	46.6		-22	32.5		263	46.3		-23	39.7		250	10.6		-23	22.0	
40	324	16.9		-11	2.5		310	38.8		-16	4.9		296	41.6		-20	0.3		282	34.8		-22	34.0		268	34.7		-23	40.1		254	59.6		-23	21.2	
23 0	329	5.7	288.8	-11	7.0	-4.6	315	27.3	288.5	-16	8.7	-3.7	301	29.9	288.3	-20	3.0	-2.7	287	23.1	288.2	-22	35.5	-1.5	273	23.2	288.5	-23	40.4	-0.3	259	48.5	288.9	-23	20.3	0.8
20	333	54.5		-11	11.6		320	15.7		-16	12.4		306	18.1		-20	5.7		292	11.3		-22	37.0		278	11.7		-23	40.7		264	37.4		-23	19.5	
40	338	43.3		-11	16.1		325	4.2		-16	16.2		311	6.4		-20	8.4		296	59.5		-22	38.5		283	0.1		-23	40.9		269	26.4		-23	18.7	

2011 Moon

h m	26 Mar GHA ° ′	d	Dec ° ′	d ′	27 Mar GHA ° ′	d	Dec ° ′	d ′	28 Mar GHA ° ′	d	Dec ° ′	d ′	29 Mar GHA ° ′	d	Dec ° ′	d ′	30 Mar GHA ° ′	d	Dec ° ′	d ′	31 Mar GHA ° ′	d	Dec ° ′	d ′
0 0	274 15.3	289.0	-23 17.8	0.9	261 21.8	289.6	-21 39.5	1.8	249 14.5	290.2	-18 59.5	2.6	237 52.2	290.8	-15 31.5	3.2	227 8.4	291.3	-11 28.3	3.6	216 53.3	291.6	-7 1.5	3.8
20	279 4.3		-23 16.9		266 11.4		-21 37.7		254 4.7		-18 56.9		242 43.0		-15 28.3		231 59.7		-11 24.8		221 44.9		-6 57.7	
40	283 53.2		-23 16.0		271 1.0		-21 35.9		258 54.9		-18 54.3		247 33.8		-15 25.1		236 51.0		-11 21.2		226 36.5		-6 53.9	
1 0	288 42.2	289.0	-23 15.1	0.9	275 50.6	289.6	-21 34.0	1.9	263 45.2	290.3	-18 51.7	2.6	252 24.7	290.8	-15 22.0	3.2	241 42.3	291.3	-11 17.6	3.6	231 28.2	291.6	-6 50.0	3.8
20	293 31.2		-23 14.2		280 40.2		-21 32.1		268 35.4		-18 49.1		257 15.5		-15 18.8		246 33.6		-11 14.0		236 19.8		-6 46.2	
40	298 20.2		-23 13.3		285 29.8		-21 30.3		273 25.7		-18 46.4		262 6.4		-15 15.6		251 24.9		-11 10.4		241 11.4		-6 42.4	
2 0	303 9.2	289.0	-23 12.3	1.0	290 19.4	289.6	-21 28.4	1.9	278 16.0	290.3	-18 43.8	2.7	266 57.2	290.9	-15 12.4	3.2	256 16.2	291.3	-11 6.8	3.6	246 3.0	291.6	-6 38.5	3.8
20	307 58.2		-23 11.3		295 9.0		-21 26.5		283 6.3		-18 41.2		271 48.1		-15 9.2		261 7.5		-11 3.3		250 54.6		-6 34.7	
40	312 47.2		-23 10.4		299 58.7		-21 24.5		287 56.5		-18 38.5		276 38.9		-15 6.0		265 58.8		-10 59.7		255 46.3		-6 30.9	
3 0	317 36.2	289.0	-23 9.4	1.0	304 48.3	289.7	-21 22.6	1.9	292 46.8	290.3	-18 35.8	2.7	281 29.8	290.9	-15 2.7	3.2	270 50.1	291.3	-10 56.0	3.6	260 37.9	291.6	-6 27.0	3.8
20	322 25.3		-23 8.3		309 38.0		-21 20.7		297 37.1		-18 33.2		286 20.7		-14 59.5		275 41.5		-10 52.4		265 29.6		-6 23.2	
40	327 14.3		-23 7.3		314 27.6		-21 18.7		302 27.4		-18 30.5		291 11.6		-14 56.3		280 32.8		-10 48.8		270 21.2		-6 19.3	
4 0	332 3.4	289.1	-23 6.3	1.1	319 17.3	289.7	-21 16.8	2.0	307 17.8	290.3	-18 27.8	2.7	296 2.5	290.9	-14 53.1	3.3	285 24.2	291.4	-10 45.2	3.6	275 12.8	291.6	-6 15.5	3.9
20	336 52.4		-23 5.2		324 7.0		-21 14.8		312 8.1		-18 25.1		300 53.4		-14 49.8		290 15.5		-10 41.6		280 4.5		-6 11.6	
40	341 41.5		-23 4.2		328 56.7		-21 12.8		316 58.4		-18 22.4		305 44.3		-14 46.6		295 6.9		-10 38.0		284 56.1		-6 7.8	
5 0	346 30.6	289.1	-23 3.1	1.1	333 46.4	289.7	-21 10.8	2.0	321 48.8	290.4	-18 19.7	2.7	310 35.2	290.9	-14 43.3	3.3	299 58.2	291.4	-10 34.3	3.6	289 47.8	291.7	-6 3.9	3.9
20	351 19.6		-23 2.0		338 36.1		-21 8.8		326 39.1		-18 16.9		315 26.1		-14 40.0		304 49.6		-10 30.7		294 39.4		-6 0.1	
40	356 8.7		-23 0.9		343 25.8		-21 6.8		331 29.5		-18 14.2		320 17.1		-14 36.8		309 41.0		-10 27.1		299 31.1		-5 56.2	
6 0	0 57.8	289.1	-22 59.8	1.2	348 15.6	289.7	-21 4.8	2.1	336 19.9	290.4	-18 11.5	2.8	325 8.0	291.0	-14 33.5	3.3	314 32.3	291.4	-10 23.4	3.6	304 22.8	291.7	-5 52.3	3.9
20	5 46.9		-22 58.6		353 5.3		-21 2.7		341 10.3		-18 8.7		329 58.9		-14 30.2		319 23.7		-10 19.8		309 14.4		-5 48.5	
40	10 36.0		-22 57.5		357 55.1		-21 0.7		346 0.7		-18 5.9		334 49.9		-14 26.9		324 15.1		-10 16.1		314 6.1		-5 44.6	
7 0	15 25.2	289.1	-22 56.3	1.2	2 44.8	289.8	-20 58.6	2.1	350 51.0	290.4	-18 3.2	2.8	339 40.8	291.0	-14 23.6	3.3	329 6.5	291.4	-10 12.5	3.7	318 57.8	291.7	-5 40.7	3.9
20	20 14.3		-22 55.1		7 34.6		-20 56.5		355 41.5		-18 0.4		344 31.8		-14 20.3		333 57.9		-10 8.8		323 49.4		-5 36.9	
40	25 3.4		-22 54.0		12 24.4		-20 54.5		0 31.9		-17 57.6		349 22.8		-14 17.0		338 49.3		-10 5.2		328 41.1		-5 33.0	
8 0	29 52.6	289.2	-22 52.8	1.2	17 14.1	289.8	-20 52.4	2.1	5 22.3	290.4	-17 54.8	2.8	354 13.8	291.0	-14 13.7	3.3	343 40.7	291.4	-10 1.5	3.7	333 32.8	291.7	-5 29.1	3.9
20	34 41.7		-22 51.5		22 3.9		-20 50.3		10 12.7		-17 52.0		359 4.8		-14 10.4		348 32.1		-9 57.8		338 24.5		-5 25.2	
40	39 30.9		-22 50.3		26 53.7		-20 48.1		15 3.2		-17 49.2		3 55.7		-14 7.1		353 23.5		-9 54.1		343 16.2		-5 21.4	
9 0	44 20.1	289.2	-22 49.1	1.3	31 43.6	289.8	-20 46.0	2.1	19 53.6	290.5	-17 46.4	2.8	8 46.7	291.0	-14 3.8	3.4	358 14.9	291.4	-9 50.5	3.7	348 7.9	291.7	-5 17.5	3.9
20	49 9.2		-22 47.8		36 33.4		-20 43.9		24 44.1		-17 43.6		13 37.8		-14 0.4		3 6.4		-9 46.8		352 59.5		-5 13.6	
40	53 58.4		-22 46.5		41 23.2		-20 41.7		29 34.5		-17 40.7		18 28.8		-13 57.1		7 57.8		-9 43.1		357 51.2		-5 9.7	
10 0	58 47.6	289.2	-22 45.2	1.3	46 13.1	289.9	-20 39.6	2.2	34 25.0	290.5	-17 37.9	2.9	23 19.8	291.0	-13 53.7	3.3	12 49.2	291.4	-9 39.4	3.7	2 42.9	291.7	-5 5.8	3.9
20	63 36.8		-22 43.9		51 2.9		-20 37.4		39 15.5		-17 35.0		28 10.8		-13 50.4		17 40.7		-9 35.7		7 34.6		-5 1.9	
40	68 26.0		-22 42.6		55 52.8		-20 35.2		44 6.0		-17 32.2		33 1.8		-13 47.0		22 32.1		-9 32.0		12 26.3		-4 58.0	
11 0	73 15.3	289.2	-22 41.3	1.4	60 42.6	289.9	-20 33.0	2.2	48 56.5	290.5	-17 29.3	2.9	37 52.9	291.1	-13 43.7	3.4	27 23.6	291.5	-9 28.3	3.7	17 18.0	291.7	-4 54.2	3.9
20	78 4.5		-22 40.0		65 32.5		-20 30.8		53 47.0		-17 26.4		42 43.9		-13 40.3		32 15.0		-9 24.6		22 9.7		-4 50.3	
40	82 53.7		-22 38.6		70 22.4		-20 28.6		58 37.5		-17 23.5		47 35.0		-13 36.9		37 6.5		-9 20.9		27 1.4		-4 46.4	
12 0	87 43.0	289.3	-22 37.2	1.4	75 12.3	289.9	-20 26.4	2.3	63 28.0	290.5	-17 20.6	2.9	52 26.1	291.1	-13 33.5	3.4	41 57.9	291.5	-9 17.2	3.7	31 53.2	291.7	-4 42.5	3.9
20	92 32.3		-22 35.9		80 2.2		-20 24.1		68 18.6		-17 17.7		57 17.1		-13 30.1		46 49.4		-9 13.5		36 44.9		-4 38.6	
40	97 21.5		-22 34.5		84 52.1		-20 21.9		73 9.1		-17 14.8		62 8.2		-13 26.8		51 40.9		-9 9.8		41 36.6		-4 34.7	
13 0	102 10.8	289.3	-22 33.1	1.4	89 42.0	289.9	-20 19.6	2.3	77 59.7	290.6	-17 11.9	2.9	66 59.3	291.1	-13 23.4	3.4	56 32.3	291.5	-9 6.1	3.7	46 28.3	291.7	-4 30.8	3.9
20	107 0.1		-22 31.7		94 32.0		-20 17.4		82 50.2		-17 9.0		71 50.4		-13 20.0		61 23.8		-9 2.3		51 20.0		-4 26.9	
40	111 49.4		-22 30.2		99 21.9		-20 15.1		87 40.8		-17 6.1		76 41.5		-13 16.5		66 15.3		-8 58.6		56 11.7		-4 23.0	
14 0	116 38.7	289.3	-22 28.8	1.5	104 11.8	290.0	-20 12.8	2.3	92 31.3	290.6	-17 3.1	2.9	81 32.5	291.1	-13 13.1	3.4	71 6.8	291.5	-8 54.9	3.7	61 3.5	291.7	-4 19.1	3.9
20	121 28.0		-22 27.3		109 1.8		-20 10.5		97 21.9		-17 0.2		86 23.7		-13 9.7		75 58.3		-8 51.1		65 55.2		-4 15.1	
40	126 17.3		-22 25.8		113 51.8		-20 8.2		102 12.5		-16 57.2		91 14.8		-13 6.3		80 49.8		-8 47.4		70 46.9		-4 11.2	
15 0	131 6.6	289.3	-22 24.4	1.5	118 41.7	290.0	-20 5.9	2.4	107 3.1	290.6	-16 54.3	3.0	96 5.9	291.1	-13 2.9	3.5	85 41.3	291.5	-8 43.7	3.8	75 38.6	291.7	-4 7.3	3.9
20	135 56.0		-22 22.9		123 31.7		-20 3.5		111 53.7		-16 51.3		100 57.0		-12 59.4		90 32.8		-8 39.9		80 30.4		-4 3.4	
40	140 45.3		-22 21.4		128 21.7		-20 1.2		116 44.3		-16 48.3		105 48.1		-12 56.0		95 24.3		-8 36.2		85 22.1		-3 59.5	
16 0	145 34.7	289.4	-22 19.8	1.5	133 11.7	290.0	-19 58.8	2.4	121 35.0	290.6	-16 45.3	3.0	110 39.3	291.2	-12 52.5	3.4	100 15.8	291.5	-8 32.4	3.7	90 13.8	291.7	-3 55.6	3.9
20	150 24.0		-22 18.3		138 1.7		-19 56.5		126 25.6		-16 42.3		115 30.4		-12 49.1		105 7.3		-8 28.7		95 5.6		-3 51.7	
40	155 13.4		-22 16.8		142 51.8		-19 54.1		131 16.2		-16 39.3		120 21.6		-12 45.6		109 58.8		-8 24.9		99 57.3		-3 47.7	
17 0	160 2.8	289.4	-22 15.2	1.6	147 41.8	290.0	-19 51.7	2.4	136 6.9	290.7	-16 36.3	3.0	125 12.7	291.2	-12 42.2	3.5	114 50.4	291.5	-8 21.2	3.8	104 49.1	291.7	-3 43.8	3.9
20	164 52.2		-22 13.6		152 31.8		-19 49.3		140 57.5		-16 33.3		130 3.9		-12 38.7		119 41.9		-8 17.4		109 40.8		-3 39.9	
40	169 41.6		-22 12.0		157 21.9		-19 46.9		145 48.2		-16 30.3		134 55.1		-12 35.2		124 33.4		-8 13.6		114 32.5		-3 36.0	
18 0	174 31.0	289.4	-22 10.4	1.6	162 11.9	290.1	-19 44.5	2.4	150 38.8	290.7	-16 27.2	3.0	139 46.2	291.2	-12 31.8	3.5	129 25.0	291.5	-8 9.9	3.8	119 24.3	291.7	-3 32.1	3.9
20	179 20.4		-22 8.8		167 2.0		-19 42.1		155 29.5		-16 24.2		144 37.4		-12 28.3		134 16.5		-8 6.1		124 16.0		-3 28.1	
40	184 9.8		-22 7.2		171 52.1		-19 39.7		160 20.2		-16 21.2		149 28.6		-12 24.8		139 8.1		-8 2.3		129 7.8		-3 24.2	
19 0	188 59.2	289.5	-22 5.6	1.7	176 42.2	290.1	-19 37.2	2.4	165 10.9	290.7	-16 18.1	3.1	154 19.8	291.2	-12 21.3	3.5	143 59.6	291.6	-7 58.5	3.8	133 59.5	291.8	-3 20.3	3.9
20	193 48.7		-22 3.9		181 32.3		-19 34.8		170 1.6		-16 15.0		159 11.0		-12 17.8		148 51.2		-7 54.8		138 51.3		-3 16.4	
40	198 38.1		-22 2.2		186 22.4		-19 32.3		174 52.3		-16 12.0		164 2.2		-12 14.3		153 42.7		-7 51.0		143 43.1		-3 12.4	
20 0	203 27.6	289.5	-22 0.6	1.7	191 12.5	290.1	-19 29.9	2.5	179 43.0	290.7	-16 8.9	3.1	168 53.4	291.2	-12 10.8	3.5	158 34.3	291.6	-7 47.2	3.8	148 34.8	291.8	-3 8.5	3.9
20	208 17.1		-21 58.9		196 2.6		-19 27.4		184 33.8		-16 5.8		173 44.6		-12 7.3		163 25.9		-7 43.4		153 26.6		-3 4.6	
40	213 6.5		-21 57.2		200 52.7		-19 24.9		189 24.5		-16 2.7		178 35.8		-12 3.8		168 17.4		-7 39.6		158 18.3		-3 0.6	
21 0	217 56.0	289.5	-21 55.5	1.7	205 42.9	290.2	-19 22.4	2.5	194 15.2	290.8	-15 59.6	3.1	183 27.1	291.2	-12 0.2	3.5	173 9.0	291.6	-7 35.8	3.8	163 10.1	291.8	-2 56.7	3.9
20	222 45.5		-21 53.8		210 33.0		-19 19.9		199 6.0		-15 56.5		188 18.3		-11 56.7		178 0.6		-7 32.0		168 1.9		-2 52.8	
40	227 35.0		-21 52.0		215 23.2		-19 17.4		203 56.7		-15 53.4		193 9.5		-11 53.2		182 52.2		-7 28.2		172 53.6		-2 48.8	
22 0	232 24.5	289.5	-21 50.3	1.8	220 13.3	290.2	-19 14.9	2.6	208 47.5	290.8	-15 50.3	3.1	198 0.8	291.3	-11 49.6	3.5	187 43.7	291.6	-7 24.4	3.8	177 45.4	291.8	-2 44.9	3.9
20	237 14.1		-21 48.5		225 3.5		-19 12.3		213 38.3		-15 47.2		202 52.0		-11 46.1		192 35.3		-7 20.6		182 37.2		-2 41.0	
40	242 3.6		-21 46.7		229 53.7		-19 9.8		218 29.0		-15 44.1		207 43.3		-11 42.6		197 26.9		-7 16.8		187 28.9		-2 37.0	
23 0	246 53.1	289.6	-21 45.0	1.8	234 43.9	290.2	-19 7.2	2.6	223 19.8	290.8	-15 40.9	3.1	212 34.6	291.3	-11 39.0	3.6	202 18.5	291.6	-7 13.0	3.8	192 20.7	291.8	-2 33.1	3.9
20	251 42.7		-21 43.2		239 34.1		-19 4.6		228 10.6		-15 37.8		217 25.8		-11 35.4		207 10.1		-7 9.2		197 12.5		-2 29.2	
40	256 32.2		-21 41.4		244 24.3		-19 2.1		233 1.4		-15 34.6		222 17.1		-11 31.9		212 1.7		-7 5.3		202 4.2		-2 25.2	

2011 Moon

	1 Apr					2 Apr					3 Apr					4 Apr					5 Apr					6 Apr				
	GHA			Dec		GHA			Dec		GHA			Dec		GHA			Dec		GHA			Dec		GHA			Dec	
h m	°	′	d	°	′	°	′	d	°	′	°	′	d	°	′	°	′	d	°	′	°	′	d	°	′	°	′	d	°	′
0 0	206	56.0	291.8	-2	21.3	197	5.2	291.8	2	22.9	187	10.0	291.6	7	1.7	177	0.1	291.4	11	25.5	166	26.8	291.0	15	24.3	155	23.2	290.5	18	47.2
20	211	47.8		-2	17.3	201	57.0		2	26.8	192	1.6		7	5.5	181	51.5		11	29.1	171	17.8		15	27.4	160	13.7		18	49.7
40	216	39.6		-2	13.4	206	48.8		2	30.8	196	53.3		7	9.3	186	42.9		11	32.6	176	8.8		15	30.4	165	4.3		18	52.2
1 0	221	31.3	291.8	-2	9.4	211	40.6	291.8	2	34.7	201	44.9	291.6	7	13.1	191	34.3	291.4	11	36.1	180	59.7	291.0	15	33.5	169	54.8	290.5	18	54.7
20	226	23.1		-2	5.5	216	32.4		2	38.6	206	36.6		7	16.8	196	25.6		11	39.6	185	50.7		15	36.6	174	45.3		18	57.2
40	231	14.9		-2	1.6	221	24.2		2	42.6	211	28.2		7	20.6	201	17.0		11	43.0	190	41.7		15	39.6	179	35.9		18	59.6
2 0	236	6.7	291.8	-1	57.6	226	15.9	291.8	2	46.5	216	19.9	291.6	7	24.4	206	8.4	291.4	11	46.5	195	32.7	291.0	15	42.7	184	26.4	290.5	19	2.1
20	240	58.5		-1	53.7	231	7.7		2	50.4	221	11.5		7	28.2	210	59.7		11	50.0	200	23.6		15	45.7	189	16.9		19	4.6
40	245	50.3		-1	49.7	235	59.5		2	54.3	226	3.1		7	31.9	215	51.1		11	53.5	205	14.6		15	48.8	194	7.4		19	7.0
3 0	250	42.0	291.8	-1	45.8	240	51.3	291.8	2	58.2	230	54.8	291.6	7	35.7	220	42.4	291.3	11	57.0	210	5.6	290.9	15	51.8	198	57.9	290.5	19	9.5
20	255	33.8		-1	41.8	245	43.1		3	2.2	235	46.4		7	39.5	225	33.7		12	0.4	214	56.5		15	54.8	203	48.4		19	11.9
40	260	25.6		-1	37.9	250	34.8		3	6.1	240	38.0		7	43.2	230	25.1		12	3.9	219	47.5		15	57.9	208	38.9		19	14.3
4 0	265	17.4	291.8	-1	33.9	255	26.6	291.8	3	10.0	245	29.6	291.6	7	47.0	235	16.4	291.3	12	7.4	224	38.4	290.9	16	0.9	213	29.3	290.5	19	16.7
20	270	9.2		-1	30.0	260	18.4		3	13.9	250	21.2		7	50.7	240	7.7		12	10.8	229	29.3		16	3.9	218	19.8		19	19.1
40	275	1.0		-1	26.0	265	10.2		3	17.8	255	12.9		7	54.5	244	59.1		12	14.3	234	20.2		16	6.9	223	10.3		19	21.5
5 0	279	52.8	291.8	-1	22.1	270	1.9	291.8	3	21.7	260	4.5	291.6	7	58.2	249	50.4	291.3	12	17.7	239	11.2	290.9	16	9.9	228	0.7	290.4	19	23.9
20	284	44.6		-1	18.1	274	53.7		3	25.7	264	56.1		8	2.0	254	41.7		12	21.1	244	2.1		16	12.8	232	51.2		19	26.3
40	289	36.4		-1	14.2	279	45.5		3	29.6	269	47.7		8	5.7	259	33.0		12	24.6	248	53.0		16	15.8	237	41.6		19	28.6
6 0	294	28.1	291.8	-1	10.2	284	37.2	291.8	3	33.5	274	39.3	291.6	8	9.5	264	24.3	291.3	12	28.0	253	43.9	290.9	16	18.8	242	32.1	290.4	19	31.0
20	299	19.9		-1	6.3	289	29.0		3	37.4	279	30.9		8	13.2	269	15.6		12	31.4	258	34.8		16	21.7	247	22.5		19	33.3
40	304	11.7		-1	2.3	294	20.8		3	41.3	284	22.5		8	16.9	274	6.9		12	34.8	263	25.7		16	24.7	252	12.9		19	35.7
7 0	309	3.5	291.8	-0	58.4	299	12.5	291.8	3	45.2	289	14.1	291.6	8	20.6	278	58.2	291.3	12	38.2	268	16.6	290.9	16	27.6	257	3.3	290.4	19	38.0
20	313	55.3		-0	54.4	304	4.3		3	49.1	294	5.6		8	24.4	283	49.5		12	41.6	273	7.4		16	30.6	261	53.8		19	40.3
40	318	47.1		-0	50.5	308	56.1		3	53.0	298	57.2		8	28.1	288	40.7		12	45.0	277	58.3		16	33.5	266	44.2		19	42.6
8 0	323	38.9	291.8	-0	46.5	313	47.8	291.8	3	56.9	303	48.8	291.6	8	31.8	293	32.0	291.3	12	48.4	282	49.2	290.9	16	36.4	271	34.6	290.4	19	44.9
20	328	30.7		-0	42.6	318	39.6		4	0.8	308	40.4		8	35.5	298	23.3		12	51.8	287	40.0		16	39.3	276	24.9		19	47.2
40	333	22.5		-0	38.6	323	31.3		4	4.7	313	32.0		8	39.2	303	14.5		12	55.2	292	30.9		16	42.2	281	15.3		19	49.5
9 0	338	14.3	291.8	-0	34.7	328	23.1	291.8	4	8.6	318	23.5	291.6	8	42.9	308	5.8	291.2	12	58.6	297	21.7	290.8	16	45.1	286	5.7	290.4	19	51.8
20	343	6.1		-0	30.7	333	14.9		4	12.5	323	15.1		8	46.6	312	57.0		13	1.9	302	12.6		16	48.0	290	56.1		19	54.0
40	347	57.9		-0	26.8	338	6.6		4	16.4	328	6.7		8	50.3	317	48.3		13	5.3	307	3.4		16	50.9	295	46.5		19	56.3
10 0	352	49.7	291.8	-0	22.8	342	58.4	291.7	4	20.3	332	58.2	291.6	8	54.0	322	39.5	291.2	13	8.7	311	54.2	290.8	16	53.8	300	36.8	290.3	19	58.5
20	357	41.5		-0	18.9	347	50.1		4	24.2	337	49.8		8	57.7	327	30.8		13	12.0	316	45.0		16	56.7	305	27.2		20	0.7
40	2	33.3		-0	14.9	352	41.9		4	28.0	342	41.3		9	1.4	332	22.0		13	15.4	321	35.8		16	59.5	310	17.5		20	2.9
11 0	7	25.1	291.8	-0	10.9	357	33.6	291.7	4	31.9	347	32.9	291.5	9	5.1	337	13.2	291.2	13	18.7	326	26.7	290.8	17	2.4	315	7.9	290.3	20	5.2
20	12	16.9		-0	7.0	2	25.3		4	35.8	352	24.4		9	8.8	342	4.4		13	22.0	331	17.5		17	5.2	319	58.2		20	7.4
40	17	8.7		-0	3.0	7	17.1		4	39.7	357	16.0		9	12.4	346	55.7		13	25.4	336	8.3		17	8.1	324	48.5		20	9.5
12 0	22	0.5	291.8	0	0.9	12	8.8	291.7	4	43.6	2	7.5	291.5	9	16.1	351	46.9	291.2	13	28.7	340	59.0	290.8	17	10.9	329	38.8	290.3	20	11.7
20	26	52.3		0	4.9	17	0.6		4	47.4	6	59.0		9	19.8	356	38.1		13	32.0	345	49.8		17	13.7	334	29.1		20	13.9
40	31	44.1		0	8.8	21	52.3		4	51.3	11	50.5		9	23.4	1	29.3		13	35.3	350	40.6		17	16.5	339	19.5		20	16.0
13 0	36	35.9	291.8	0	12.8	26	44.0	291.7	4	55.2	16	42.1	291.5	9	27.1	6	20.5	291.2	13	38.6	355	31.4	290.8	17	19.3	344	9.8	290.3	20	18.2
20	41	27.7		0	16.7	31	35.8		4	59.1	21	33.6		9	30.8	11	11.7		13	41.9	0	22.1		17	22.1	349	0.0		20	20.3
40	46	19.5		0	20.7	36	27.5		5	2.9	26	25.1		9	34.4	16	2.8		13	45.2	5	12.9		17	24.9	353	50.3		20	22.5
14 0	51	11.3	291.8	0	24.6	41	19.2	291.7	5	6.8	31	16.6	291.5	9	38.1	20	54.0	291.2	13	48.5	10	3.6	290.7	17	27.7	358	40.6	290.3	20	24.6
20	56	3.1		0	28.6	46	10.9		5	10.7	36	8.1		9	41.7	25	45.2		13	51.8	14	54.4		17	30.5	3	30.9		20	26.7
40	60	54.9		0	32.5	51	2.7		5	14.5	40	59.6		9	45.3	30	36.4		13	55.1	19	45.1		17	33.2	8	21.2		20	28.8
15 0	65	46.7	291.8	0	36.5	55	54.4	291.7	5	18.4	45	51.1	291.5	9	49.0	35	27.5	291.1	13	58.4	24	35.9	290.7	17	36.0	13	11.4	290.2	20	30.9
20	70	38.5		0	40.4	60	46.1		5	22.2	50	42.6		9	52.6	40	18.7		14	1.6	29	26.6		17	38.7	18	1.7		20	32.9
40	75	30.3		0	44.4	65	37.8		5	26.1	55	34.1		9	56.2	45	9.8		14	4.9	34	17.3		17	41.5	22	51.9		20	35.0
16 0	80	22.1	291.8	0	48.3	70	29.5	291.7	5	30.0	60	25.6	291.5	9	59.9	50	1.0	291.1	14	8.1	39	8.0	290.7	17	44.2	27	42.2	290.2	20	37.1
20	85	13.9		0	52.3	75	21.3		5	33.8	65	17.1		10	3.5	54	52.1		14	11.4	43	58.7		17	46.9	32	32.4		20	39.1
40	90	5.7		0	56.2	80	13.0		5	37.7	70	8.6		10	7.1	59	43.2		14	14.6	48	49.4		17	49.6	37	22.6		20	41.1
17 0	94	57.5	291.8	1	0.2	85	4.7	291.7	5	41.5	75	0.1	291.5	10	10.7	64	34.4	291.1	14	17.9	53	40.1	290.7	17	52.3	42	12.8	290.2	20	43.2
20	99	49.3		1	4.1	89	56.4		5	45.3	79	51.5		10	14.3	69	25.5		14	21.1	58	30.8		17	55.0	47	3.1		20	45.2
40	104	41.1		1	8.1	94	48.1		5	49.2	84	43.0		10	17.9	74	16.6		14	24.3	63	21.5		17	57.7	51	53.3		20	47.2
18 0	109	32.9	291.8	1	12.0	99	39.8	291.7	5	53.0	89	34.5	291.5	10	21.5	79	7.7	291.1	14	27.5	68	12.1	290.7	18	0.4	56	43.5	290.2	20	49.2
20	114	24.7		1	16.0	104	31.5		5	56.9	94	25.9		10	25.1	83	58.8		14	30.7	73	2.8		18	3.1	61	33.7		20	51.2
40	119	16.5		1	19.9	109	23.2		6	0.7	99	17.4		10	28.7	88	49.9		14	33.9	77	53.5		18	5.7	66	23.9		20	53.1
19 0	124	8.3	291.8	1	23.8	114	14.9	291.7	6	4.5	104	8.9	291.4	10	32.3	93	41.0	291.1	14	37.1	82	44.1	290.6	18	8.4	71	14.0	290.2	20	55.1
20	129	0.1		1	27.8	119	6.6		6	8.4	109	0.3		10	35.9	98	32.1		14	40.3	87	34.8		18	11.0	76	4.2		20	57.0
40	133	51.9		1	31.7	123	58.3		6	12.2	113	51.8		10	39.5	103	23.2		14	43.5	92	25.4		18	13.7	80	54.4		20	59.0
20 0	138	43.7	291.8	1	35.7	128	50.0	291.7	6	16.0	118	43.2	291.4	10	43.0	108	14.3	291.1	14	46.7	97	16.1	290.6	18	16.3	85	44.6	290.2	21	0.9
20	143	35.5		1	39.6	133	41.6		6	19.8	123	34.6		10	46.6	113	5.3		14	49.8	102	6.7		18	18.9	90	34.7		21	2.8
40	148	27.3		1	43.6	138	33.3		6	23.7	128	26.1		10	50.2	117	56.4		14	53.0	106	57.3		18	21.5	95	24.9		21	4.7
21 0	153	19.1	291.8	1	47.5	143	25.0	291.7	6	27.5	133	17.5	291.4	10	53.7	122	47.5	291.0	14	56.2	111	47.9	290.6	18	24.1	100	15.0	290.1	21	6.6
20	158	10.9		1	51.4	148	16.7		6	31.3	138	8.9		10	57.3	127	38.5		14	59.3	116	38.5		18	26.7	105	5.2		21	8.5
40	163	2.7		1	55.4	153	8.3		6	35.1	143	0.3		11	0.8	132	29.6		15	2.5	121	29.1		18	29.3	109	55.3		21	10.4
22 0	167	54.5	291.8	1	59.3	158	0.0	291.7	6	38.9	147	51.7	291.4	11	4.4	137	20.6	291.0	15	5.6	126	19.7	290.6	18	31.9	114	45.4	290.1	21	12.3
20	172	46.3		2	3.2	162	51.7		6	42.7	152	43.2		11	7.9	142	11.7		15	8.7	131	10.3		18	34.5	119	35.5		21	14.1
40	177	38.1		2	7.2	167	43.4		6	46.5	157	34.6		11	11.4	147	2.7		15	11.8	136	0.9		18	37.0	124	25.6		21	15.9
23 0	182	29.9	291.8	2	11.1	172	35.0	291.7	6	50.3	162	26.0	291.4	11	15.0	151	53.7	291.0	15	15.0	140	51.5	290.6	18	39.6	129	15.7	290.1	21	17.8
20	187	21.6		2	15.0	177	26.7		6	54.1	167	17.4		11	18.5	156	44.7		15	18.1	145	42.0		18	42.1	134	5.8		21	19.6
40	192	13.4		2	19.0	182	18.3		6	57.9	172	8.7		11	22.0	161	35.7		15	21.2	150	32.6		18	44.6	138	55.9		21	21.4

2011 Moon

	7 Apr					8 Apr					9 Apr					10 Apr					11 Apr					12 Apr				
	GHA			Dec		GHA			Dec		GHA			Dec		GHA			Dec		GHA			Dec		GHA			Dec	
h m	°	'	d	°	'	°	'	d	°	'	°	'	d	°	'	°	'	d	°	'	°	'	d	°	'	°	'	d	°	'
0 0	143	46.0	290.1	21	23.2	131	36.6	289.7	23	1.8	119	1.0	289.4	23	34.1	106	9.7	289.2	22	54.0	93	13.9	289.2	20	59.8	80	23.0	289.4	17	54.2
20	148	36.1		21	25.0	136	26.2		23	2.7	123	50.4		23	34.0	110	58.9		22	52.9	98	3.1		20	57.7	85	12.3		17	51.1
40	153	26.2		21	26.8	141	15.9		23	3.6	128	39.8		23	34.0	115	48.1		22	51.8	102	52.4		20	55.6	90	1.7		17	48.1
1 0	158	16.3	290.1	21	28.5	146	5.6	289.6	23	4.5	133	29.1	289.4	23	33.9	120	37.4	289.2	22	50.7	107	41.6	289.2	20	53.5	94	51.1	289.4	17	45.0
20	163	6.3		21	30.3	150	55.2		23	5.4	138	18.5		23	33.8	125	26.6		22	49.6	112	30.9		20	51.3	99	40.4		17	41.9
40	167	56.4		21	32.0	155	44.8		23	6.3	143	7.9		23	33.7	130	15.8		22	48.5	117	20.1		20	49.2	104	29.8		17	38.8
2 0	172	46.4	290.0	21	33.7	160	34.5	289.6	23	7.1	147	57.2	289.3	23	33.5	135	5.0	289.2	22	47.3	122	9.4	289.3	20	47.0	109	19.2	289.4	17	35.7
20	177	36.5		21	35.5	165	24.1		23	8.0	152	46.6		23	33.4	139	54.3		22	46.2	126	58.6		20	44.8	114	8.5		17	32.6
40	182	26.5		21	37.2	170	13.8		23	8.8	157	35.9		23	33.3	144	43.5		22	45.0	131	47.9		20	42.6	118	57.9		17	29.4
3 0	187	16.5	290.0	21	38.9	175	3.4	289.6	23	9.6	162	25.3	289.3	23	33.1	149	32.7	289.2	22	43.8	136	37.1	289.3	20	40.4	123	47.3	289.4	17	26.3
20	192	6.6		21	40.6	179	53.0		23	10.4	167	14.6		23	32.9	154	21.9		22	42.6	141	26.4		20	38.2	128	36.6		17	23.1
40	196	56.6		21	42.2	184	42.6		23	11.2	172	3.9		23	32.7	159	11.2		22	41.3	146	15.6		20	35.9	133	26.0		17	19.9
4 0	201	46.6	290.0	21	43.9	189	32.2	289.6	23	12.0	176	53.3	289.3	23	32.5	164	0.4	289.2	22	40.1	151	4.9	289.3	20	33.7	138	15.4	289.4	17	16.8
20	206	36.6		21	45.5	194	21.8		23	12.8	181	42.6		23	32.3	168	49.6		22	38.9	155	54.2		20	31.4	143	4.7		17	13.6
40	211	26.6		21	47.2	199	11.4		23	13.5	186	31.9		23	32.1	173	38.8		22	37.6	160	43.4		20	29.1	147	54.1		17	10.3
5 0	216	16.6	290.0	21	48.8	204	1.0	289.6	23	14.3	191	21.3	289.3	23	31.8	178	28.0	289.2	22	36.3	165	32.7	289.3	20	26.8	152	43.5	289.4	17	7.1
20	221	6.6		21	50.4	208	50.6		23	15.0	196	10.6		23	31.6	183	17.3		22	35.0	170	21.9		20	24.5	157	32.9		17	3.9
40	225	56.6		21	52.0	213	40.2		23	15.7	200	59.9		23	31.3	188	6.5		22	33.7	175	11.2		20	22.2	162	22.3		17	0.6
6 0	230	46.5	290.0	21	53.6	218	29.8	289.6	23	16.4	205	49.2	289.3	23	31.0	192	55.7	289.2	22	32.4	180	0.5	289.3	20	19.9	167	11.7	289.4	16	57.4
20	235	36.5		21	55.2	223	19.4		23	17.1	210	38.5		23	30.7	197	44.9		22	31.0	184	49.7		20	17.5	172	1.0		16	54.1
40	240	26.5		21	56.8	228	8.9		23	17.8	215	27.9		23	30.4	202	34.2		22	29.7	189	39.0		20	15.2	176	50.4		16	50.8
7 0	245	16.4	289.9	21	58.3	232	58.5	289.6	23	18.4	220	17.2	289.3	23	30.0	207	23.4	289.2	22	28.3	194	28.3	289.3	20	12.8	181	39.8	289.4	16	47.5
20	250	6.4		21	59.9	237	48.1		23	19.1	225	6.5		23	29.7	212	12.6		22	26.9	199	17.5		20	10.4	186	29.2		16	44.2
40	254	56.3		22	1.4	242	37.6		23	19.7	229	55.8		23	29.3	217	1.8		22	25.5	204	6.8		20	8.0	191	18.6		16	40.9
8 0	259	46.3	289.9	22	2.9	247	27.2	289.5	23	20.3	234	45.1	289.3	23	28.9	221	51.0	289.2	22	24.1	208	56.1	289.3	20	5.6	196	8.0	289.4	16	37.6
20	264	36.2		22	4.5	252	16.7		23	20.9	239	34.4		23	28.5	226	40.2		22	22.7	213	45.3		20	3.2	200	57.4		16	34.2
40	269	26.1		22	6.0	257	6.3		23	21.5	244	23.7		23	28.1	231	29.5		22	21.3	218	34.6		20	0.7	205	46.8		16	30.9
9 0	274	16.0	289.9	22	7.4	261	55.8	289.5	23	22.1	249	13.0	289.3	23	27.7	236	18.7	289.2	22	19.8	223	23.9	289.3	19	58.3	210	36.2	289.4	16	27.5
20	279	6.0		22	8.9	266	45.4		23	22.7	254	2.3		23	27.3	241	7.9		22	18.4	228	13.2		19	55.8	215	25.6		16	24.1
40	283	55.9		22	10.4	271	34.9		23	23.2	258	51.6		23	26.8	245	57.1		22	16.9	233	2.4		19	53.3	220	15.0		16	20.8
10 0	288	45.8	289.9	22	11.8	276	24.4	289.5	23	23.7	263	40.9	289.3	23	26.4	250	46.3	289.2	22	15.4	237	51.7	289.3	19	50.8	225	4.4	289.4	16	17.4
20	293	35.7		22	13.3	281	13.9		23	24.3	268	30.2		23	25.9	255	35.6		22	13.9	242	41.0		19	48.3	229	53.9		16	13.9
40	298	25.6		22	14.7	286	3.5		23	24.8	273	19.5		23	25.4	260	24.8		22	12.3	247	30.3		19	45.8	234	43.3		16	10.5
11 0	303	15.4	289.9	22	16.1	290	53.0	289.5	23	25.3	278	8.8	289.3	23	24.9	265	14.0	289.2	22	10.8	252	19.6	289.3	19	43.2	239	32.7	289.4	16	7.1
20	308	5.3		22	17.5	295	42.5		23	25.8	282	58.0		23	24.4	270	3.2		22	9.3	257	8.9		19	40.7	244	22.1		16	3.6
40	312	55.2		22	18.9	300	32.0		23	26.2	287	47.3		23	23.8	274	52.4		22	7.7	261	58.1		19	38.1	249	11.5		16	0.2
12 0	317	45.1	289.9	22	20.3	305	21.5	289.5	23	26.7	292	36.6	289.3	23	23.3	279	41.7	289.2	22	6.1	266	47.4	289.3	19	35.6	254	0.9	289.4	15	56.7
20	322	34.9		22	21.7	310	11.0		23	27.1	297	25.9		23	22.7	284	30.9		22	4.5	271	36.7		19	33.0	258	50.4		15	53.2
40	327	24.8		22	23.0	315	0.5		23	27.6	302	15.2		23	22.2	289	20.1		22	2.9	276	26.0		19	30.4	263	39.8		15	49.7
13 0	332	14.6	289.8	22	24.4	319	50.0	289.5	23	28.0	307	4.4	289.3	23	21.6	294	9.3	289.2	22	1.3	281	15.3	289.3	19	27.8	268	29.2	289.4	15	46.2
20	337	4.5		22	25.7	324	39.5		23	28.4	311	53.7		23	21.0	298	58.5		21	59.6	286	4.6		19	25.1	273	18.6		15	42.7
40	341	54.3		22	27.0	329	28.9		23	28.8	316	43.0		23	20.3	303	47.8		21	58.0	290	53.9		19	22.5	278	8.1		15	39.2
14 0	346	44.2	289.8	22	28.3	334	18.4	289.5	23	29.2	321	32.3	289.3	23	19.7	308	37.0	289.2	21	56.3	295	43.2	289.3	19	19.8	282	57.5	289.4	15	35.7
20	351	34.0		22	29.6	339	7.9		23	29.5	326	21.5		23	19.1	313	26.2		21	54.6	300	32.5		19	17.2	287	46.9		15	32.1
40	356	23.8		22	30.9	343	57.4		23	29.9	331	10.8		23	18.4	318	15.4		21	53.0	305	21.8		19	14.5	292	36.4		15	28.6
15 0	1	13.6	289.8	22	32.2	348	46.8	289.5	23	30.2	336	0.0	289.3	23	17.7	323	4.7	289.2	21	51.2	310	11.1	289.3	19	11.8	297	25.8	289.4	15	25.0
20	6	3.4		22	33.4	353	36.3		23	30.5	340	49.3		23	17.0	327	53.9		21	49.5	315	0.4		19	9.1	302	15.2		15	21.4
40	10	53.2		22	34.7	358	25.8		23	30.8	345	38.6		23	16.3	332	43.1		21	47.8	319	49.7		19	6.4	307	4.7		15	17.8
16 0	15	43.0	289.8	22	35.9	3	15.2	289.4	23	31.1	350	27.8	289.3	23	15.6	337	32.3	289.2	21	46.0	324	39.0	289.3	19	3.6	311	54.1	289.4	15	14.2
20	20	32.8		22	37.1	8	4.7		23	31.4	355	17.1		23	14.9	342	21.5		21	44.3	329	28.4		19	0.9	316	43.6		15	10.6
40	25	22.6		22	38.4	12	54.1		23	31.7	0	6.3		23	14.1	347	10.8		21	42.5	334	17.7		18	58.1	321	33.0		15	7.0
17 0	30	12.4	289.8	22	39.6	17	43.6	289.4	23	31.9	4	55.6	289.3	23	13.4	352	0.0	289.2	21	40.7	339	7.0	289.3	18	55.4	326	22.5	289.4	15	3.3
20	35	2.2		22	40.7	22	33.0		23	32.2	9	44.9		23	12.6	356	49.2		21	38.9	343	56.3		18	52.6	331	11.9		14	59.7
40	39	51.9		22	41.9	27	22.4		23	32.4	14	34.1		23	11.8	1	38.5		21	37.1	348	45.6		18	49.8	336	1.4		14	56.0
18 0	44	41.7	289.8	22	43.1	32	11.9	289.4	23	32.6	19	23.4	289.2	23	11.0	6	27.7	289.2	21	35.2	353	34.9	289.3	18	47.0	340	50.8	289.5	14	52.3
20	49	31.5		22	44.2	37	1.3		23	32.8	24	12.6		23	10.2	11	16.9		21	33.4	358	24.3		18	44.1	345	40.3		14	48.7
40	54	21.2		22	45.4	41	50.7		23	33.0	29	1.9		23	9.3	16	6.1		21	31.5	3	13.6		18	41.3	350	29.7		14	45.0
19 0	59	11.0	289.7	22	46.5	46	40.1	289.4	23	33.2	33	51.1	289.2	23	8.5	20	55.4	289.2	21	29.6	8	2.9	289.3	18	38.4	355	19.2	289.5	14	41.3
20	64	0.7		22	47.6	51	29.6		23	33.3	38	40.3		23	7.6	25	44.6		21	27.7	12	52.2		18	35.6	0	8.6		14	37.6
40	68	50.5		22	48.7	56	19.0		23	33.5	43	29.6		23	6.7	30	33.8		21	25.8	17	41.6		18	32.7	4	58.1		14	33.8
20 0	73	40.2	289.7	22	49.8	61	8.4	289.4	23	33.6	48	18.8	289.2	23	5.8	35	23.1	289.2	21	23.9	22	30.9	289.3	18	29.8	9	47.6	289.5	14	30.1
20	78	29.9		22	50.8	65	57.8		23	33.7	53	8.1		23	4.9	40	12.3		21	22.0	27	20.2		18	26.9	14	37.0		14	26.4
40	83	19.6		22	51.9	70	47.2		23	33.8	57	57.3		23	4.0	45	1.5		21	20.0	32	9.6		18	24.0	19	26.5		14	22.6
21 0	88	9.4	289.7	22	53.0	75	36.6	289.4	23	33.9	62	46.6	289.2	23	3.1	49	50.8	289.2	21	18.1	36	58.9	289.3	18	21.1	24	16.0	289.5	14	18.8
20	92	59.1		22	54.0	80	26.0		23	34.0	67	35.8		23	2.1	54	40.0		21	16.1	41	48.2		18	18.1	29	5.4		14	15.1
40	97	48.8		22	55.0	85	15.4		23	34.0	72	25.0		23	1.2	59	29.2		21	14.1	46	37.6		18	15.2	33	54.9		14	11.3
22 0	102	38.5	289.7	22	56.0	90	4.8	289.4	23	34.1	77	14.3	289.2	23	0.2	64	18.5	289.2	21	12.1	51	26.9	289.3	18	12.2	38	44.4	289.5	14	7.5
20	107	28.2		22	57.0	94	54.2		23	34.1	82	3.5		22	59.2	69	7.7		21	10.1	56	16.3		18	9.3	43	33.8		14	3.7
40	112	17.9		22	58.0	99	43.5		23	34.1	86	52.7		22	58.2	73	56.9		21	8.1	61	5.6		18	6.3	48	23.3		13	59.8
23 0	117	7.5	289.7	22	59.0	104	32.9	289.4	23	34.1	91	42.0	289.2	22	57.2	78	46.2	289.2	21	6.0	65	54.9	289.4	18	3.3	53	12.8	289.5	13	56.0
20	121	57.2		22	59.9	109	22.3		23	34.1	96	31.2		22	56.1	83	35.4		21	4.0	70	44.3		18	0.3	58	2.3		13	52.2
40	126	46.9		23	0.9	114	11.7		23	34.1	101	20.4		22	55.1	88	24.7		21	1.9	75	33.6		17	57.2	62	51.8		13	48.3

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h m	13 Apr GHA ° ′	d	Dec ° ′	d ′	14 Apr GHA ° ′	d	Dec ° ′	d ′	15 Apr GHA ° ′	d	Dec ° ′	d ′	16 Apr GHA ° ′	d	Dec ° ′	d ′	17 Apr GHA ° ′	d	Dec ° ′	d ′	18 Apr GHA ° ′	d	Dec ° ′	d ′
0 0	67 41.2	289.5	13 44.5	-3.9	55 7.0	289.6	8 42.1	-4.5	42 33.7	289.5	3 2.8	-4.9	29 51.0	289.3	-2 54.2	-5.0	16 48.2	288.9	-8 45.6	-4.7	3 16.7	288.5	-14 6.0	-4.1
20	72 30.7		13 40.6		59 56.6		8 37.6		47 23.2		2 57.9		34 40.3		-2 59.2		21 37.1		-8 50.3		8 5.2		-14 10.1	
40	77 20.2		13 36.7		64 46.1		8 33.1		52 12.7		2 53.0		39 29.6		-3 4.2		26 26.1		-8 55.0		12 53.7		-14 14.2	
1 0	82 9.7	289.5	13 32.8	-3.9	69 35.7	289.6	8 28.6	-4.5	57 2.2	289.5	2 48.1	-4.9	44 18.9	289.3	-3 9.1	-5.0	31 15.0	288.9	-8 59.8	-4.7	17 42.2	288.5	-14 18.3	-4.1
20	86 59.2		13 28.9		74 25.3		8 24.1		61 51.6		2 43.2		49 8.1		-3 14.1		36 3.9		-9 4.5		22 30.7		-14 22.3	
40	91 48.7		13 25.0		79 14.8		8 19.6		66 41.1		2 38.3		53 57.4		-3 19.1		40 52.8		-9 9.2		27 19.2		-14 26.4	
2 0	96 38.2	289.5	13 21.1	-3.9	84 4.4	289.6	8 15.0	-4.5	71 30.6	289.5	2 33.4	-4.9	58 46.7	289.3	-3 24.0	-5.0	45 41.7	288.9	-9 13.8	-4.7	32 7.7	288.5	-14 30.5	-4.0
20	101 27.7		13 17.2		88 53.9		8 10.5		76 20.1		2 28.5		63 36.0		-3 29.0		50 30.6		-9 18.5		36 56.2		-14 34.5	
40	106 17.2		13 13.2		93 43.5		8 5.9		81 9.6		2 23.6		68 25.2		-3 34.0		55 19.5		-9 23.2		41 44.6		-14 38.5	
3 0	111 6.6	289.5	13 9.3	-4.0	98 33.0	289.6	8 1.4	-4.6	85 59.1	289.5	2 18.7	-4.9	73 14.5	289.2	-3 38.9	-5.0	60 8.4	288.9	-9 27.9	-4.7	46 33.1	288.4	-14 42.6	-4.0
20	115 56.1		13 5.3		103 22.6		7 56.8		90 48.6		2 13.7		78 3.7		-3 43.9		64 57.3		-9 32.5		51 21.5		-14 46.6	
40	120 45.6		13 1.3		108 12.1		7 52.3		95 38.0		2 8.8		82 53.0		-3 48.9		69 46.2		-9 37.2		56 10.0		-14 50.6	
4 0	125 35.1	289.5	12 57.4	-4.0	113 1.7	289.6	7 47.7	-4.6	100 27.5	289.5	2 3.9	-4.9	87 42.2	289.2	-3 53.8	-5.0	74 35.1	288.9	-9 41.9	-4.6	60 58.4	288.4	-14 54.5	-4.0
20	130 24.6		12 53.4		117 51.2		7 43.1		105 17.0		1 59.0		92 31.5		-3 58.8		79 24.0		-9 46.5		65 46.9		-14 58.5	
40	135 14.1		12 49.4		122 40.8		7 38.5		110 6.4		1 54.0		97 20.7		-4 3.7		84 12.8		-9 51.1		70 35.3		-15 2.5	
5 0	140 3.7	289.5	12 45.4	-4.0	127 30.3	289.6	7 33.9	-4.6	114 55.9	289.5	1 49.1	-4.9	102 9.9	289.2	-4 8.7	-4.9	89 1.7	288.8	-9 55.8	-4.6	75 23.7	288.4	-15 6.4	-3.9
20	144 53.2		12 41.3		132 19.9		7 29.3		119 45.4		1 44.2		106 59.2		-4 13.6		93 50.5		-10 0.4		80 12.1		-15 10.4	
40	149 42.7		12 37.3		137 9.4		7 24.7		124 34.8		1 39.3		111 48.4		-4 18.6		98 39.4		-10 5.0		85 0.6		-15 14.3	
6 0	154 32.2	289.5	12 33.3	-4.1	141 59.0	289.6	7 20.1	-4.6	129 24.3	289.5	1 34.3	-4.9	116 37.6	289.2	-4 23.5	-5.0	103 28.2	288.8	-10 9.6	-4.6	89 49.0	288.4	-15 18.2	-3.9
20	159 21.7		12 29.2		146 48.5		7 15.5		134 13.8		1 29.4		121 26.8		-4 28.5		108 17.1		-10 14.2		94 37.4		-15 22.1	
40	164 11.2		12 25.2		151 38.1		7 10.8		139 3.2		1 24.4		126 16.0		-4 33.4		113 5.9		-10 18.8		99 25.8		-15 26.0	
7 0	169 0.7	289.5	12 21.1	-4.1	156 27.6	289.5	7 6.2	-4.6	143 52.7	289.5	1 19.5	-5.0	131 5.2	289.2	-4 38.4	-4.9	117 54.7	288.8	-10 23.4	-4.6	104 14.1	288.4	-15 29.9	-3.8
20	173 50.2		12 17.0		161 17.2		7 1.6		148 42.1		1 14.5		135 54.4		-4 43.3		122 43.5		-10 28.0		109 2.5		-15 33.7	
40	178 39.7		12 13.0		166 6.7		6 56.9		153 31.6		1 9.6		140 43.6		-4 48.3		127 32.3		-10 32.6		113 50.9		-15 37.6	
8 0	183 29.2	289.5	12 8.9	-4.1	170 56.3	289.5	6 52.3	-4.7	158 21.0	289.4	1 4.6	-4.9	145 32.8	289.2	-4 53.2	-4.9	132 21.2	288.8	-10 37.1	-4.6	118 39.3	288.4	-15 41.4	-3.8
20	188 18.8		12 4.8		175 45.8		6 47.6		163 10.5		0 59.7		150 22.0		-4 58.1		137 10.0		-10 41.7		123 27.6		-15 45.3	
40	193 8.3		12 0.6		180 35.4		6 42.9		167 59.9		0 54.7		155 11.2		-5 3.0		141 58.7		-10 46.2		128 16.0		-15 49.1	
9 0	197 57.8	289.5	11 56.5	-4.1	185 24.9	289.5	6 38.3	-4.7	172 49.4	289.4	0 49.8	-5.0	160 0.4	289.2	-5 8.0	-4.9	146 47.5	288.8	-10 50.8	-4.5	133 4.4	288.3	-15 52.9	-3.8
20	202 47.3		11 52.4		190 14.5		6 33.6		177 38.8		0 44.8		164 49.5		-5 12.9		151 36.3		-10 55.3		137 52.7		-15 56.7	
40	207 36.8		11 48.2		195 4.0		6 28.9		182 28.2		0 39.9		169 38.7		-5 17.8		156 25.1		-10 59.8		142 41.0		-16 0.5	
10 0	212 26.4	289.5	11 44.1	-4.2	199 53.6	289.5	6 24.2	-4.7	187 17.7	289.4	0 34.9	-5.0	174 27.9	289.2	-5 22.7	-4.9	161 13.9	288.8	-11 4.3	-4.5	147 29.4	288.3	-16 4.2	-3.7
20	217 15.9		11 39.9		204 43.1		6 19.5		192 7.1		0 29.9		179 17.0		-5 27.6		166 2.6		-11 8.9		152 17.7		-16 8.0	
40	222 5.4		11 35.8		209 32.7		6 14.8		196 56.5		0 25.0		184 6.2		-5 32.6		170 51.4		-11 13.4		157 6.0		-16 11.7	
11 0	226 54.9	289.5	11 31.6	-4.2	214 22.2	289.5	6 10.1	-4.7	201 45.9	289.4	0 20.0	-5.0	188 55.3	289.1	-5 37.5	-4.9	175 40.1	288.7	-11 17.9	-4.5	161 54.4	288.3	-16 15.4	-3.7
20	231 44.5		11 27.4		219 11.7		6 5.4		206 35.4		0 15.0		193 44.5		-5 42.4		180 28.9		-11 22.3		166 42.7		-16 19.2	
40	236 34.0		11 23.2		224 1.3		6 0.7		211 24.8		0 10.1		198 33.6		-5 47.3		185 17.6		-11 26.8		171 31.0		-16 22.9	
12 0	241 23.5	289.5	11 19.0	-4.2	228 50.8	289.5	5 56.0	-4.7	216 14.2	289.4	0 5.1	-5.0	203 22.8	289.1	-5 52.2	-4.9	190 6.4	288.7	-11 31.3	-4.4	176 19.3	288.3	-16 26.5	-3.7
20	246 13.0		11 14.8		233 40.4		5 51.2		221 3.6		0 0.1		208 11.9		-5 57.1		194 55.1		-11 35.7		181 7.6		-16 30.2	
40	251 2.6		11 10.6		238 29.9		5 46.5		225 53.0		-0 4.8		213 1.0		-6 1.9		199 43.8		-11 40.2		185 55.9		-16 33.9	
13 0	255 52.1	289.5	11 6.3	-4.2	243 19.5	289.5	5 41.8	-4.8	230 42.4	289.4	-0 9.8	-5.0	217 50.1	289.1	-6 6.8	-4.9	204 32.5	288.7	-11 44.6	-4.4	190 44.2	288.3	-16 37.5	-3.6
20	260 41.6		11 2.1		248 9.0		5 37.0		235 31.8		-0 14.8		222 39.2		-6 11.7		209 21.2		-11 49.1		195 32.4		-16 41.2	
40	265 31.2		10 57.9		252 58.5		5 32.3		240 21.2		-0 19.8		227 28.4		-6 16.6		214 9.9		-11 53.5		200 20.7		-16 44.8	
14 0	270 20.7	289.5	10 53.6	-4.3	257 48.1	289.5	5 27.5	-4.8	245 10.6	289.4	-0 24.7	-5.0	232 17.5	289.1	-6 21.5	-4.9	218 58.6	288.7	-11 57.9	-4.4	205 9.0	288.3	-16 48.4	-3.6
20	275 10.2		10 49.3		262 37.6		5 22.8		250 0.0		-0 29.7		237 6.6		-6 26.3		223 47.3		-12 2.3		209 57.2		-16 52.0	
40	279 59.8		10 45.1		267 27.1		5 18.0		254 49.4		-0 34.7		241 55.7		-6 31.2		228 36.0		-12 6.7		214 45.5		-16 55.6	
15 0	284 49.3	289.5	10 40.8	-4.3	272 16.7	289.5	5 13.2	-4.8	259 38.8	289.4	-0 39.7	-5.0	246 44.7	289.1	-6 36.1	-4.8	233 24.7	288.7	-12 11.1	-4.4	219 33.8	288.2	-16 59.1	-3.6
20	289 38.9		10 36.5		277 6.2		5 8.4		264 28.2		-0 44.7		251 33.8		-6 40.9		238 13.4		-12 15.5		224 22.0		-17 2.7	
40	294 28.4		10 32.2		281 55.8		5 3.7		269 17.6		-0 49.6		256 22.9		-6 45.8		243 2.0		-12 19.9		229 10.2		-17 6.2	
16 0	299 17.9	289.5	10 27.9	-4.3	286 45.3	289.5	4 58.9	-4.8	274 7.0	289.4	-0 54.6	-5.0	261 12.0	289.1	-6 50.6	-4.9	247 50.7	288.6	-12 24.2	-4.4	233 58.5	288.2	-17 9.8	-3.5
20	304 7.5		10 23.6		291 34.8		4 54.1		278 56.3		-0 59.6		266 1.1		-6 55.5		252 39.4		-12 28.6		238 46.7		-17 13.3	
40	308 57.0		10 19.3		296 24.3		4 49.3		283 45.7		-1 4.6		270 50.1		-7 0.3		257 28.0		-12 32.9		243 34.9		-17 16.8	
17 0	313 46.6	289.5	10 14.9	-4.3	301 13.9	289.5	4 44.5	-4.8	288 35.1	289.4	-1 9.6	-5.0	275 39.2	289.0	-7 5.2	-4.8	262 16.6	288.6	-12 37.3	-4.3	248 23.2	288.2	-17 20.3	-3.4
20	318 36.1		10 10.6		306 3.4		4 39.7		293 24.4		-1 14.6		280 28.2		-7 10.0		267 5.3		-12 41.6		253 11.4		-17 23.7	
40	323 25.6		10 6.2		310 52.9		4 34.9		298 13.8		-1 19.5		285 17.3		-7 14.8		271 53.9		-12 45.9		257 59.6		-17 27.2	
18 0	328 15.2	289.5	10 1.9	-4.4	315 42.5	289.5	4 30.1	-4.8	303 3.2	289.4	-1 24.5	-5.0	290 6.3	289.0	-7 19.6	-4.8	276 42.5	288.6	-12 50.2	-4.3	262 47.8	288.2	-17 30.6	-3.4
20	333 4.7		9 57.5		320 32.0		4 25.3		307 52.5		-1 29.5		294 55.4		-7 24.5		281 31.2		-12 54.5		267 36.0		-17 34.1	
40	337 54.3		9 53.1		325 21.5		4 20.4		312 41.9		-1 34.5		299 44.4		-7 29.3		286 19.8		-12 58.8		272 24.2		-17 37.5	
19 0	342 43.8	289.5	9 48.8	-4.4	330 11.0	289.5	4 15.6	-4.8	317 31.2	289.3	-1 39.5	-5.0	304 33.4	289.0	-7 34.1	-4.8	291 8.4	288.6	-13 3.1	-4.2	277 12.4	288.2	-17 40.9	-3.4
20	347 33.4		9 44.4		335 0.5		4 10.8		322 20.6		-1 44.5		309 22.4		-7 38.9		295 57.0		-13 7.3		282 0.5		-17 44.3	
40	352 22.9		9 40.0		339 50.1		4 6.0		327 9.9		-1 49.5		314 11.5		-7 43.7		300 45.6		-13 11.6		286 48.7		-17 47.7	
20 0	357 12.5	289.5	9 35.6	-4.4	344 39.6	289.5	4 1.1	-4.8	331 59.2	289.3	-1 54.4	-5.0	319 0.5	289.0	-7 48.5	-4.8	305 34.2	288.6	-13 15.8	-4.2	291 36.9	288.2	-17 51.0	-3.3
20	2 2.0		9 31.2		349 29.1		3 56.3		336 48.6		-1 59.4		323 49.5		-7 53.3		310 22.7		-13 20.1		296 25.1		-17 54.4	
40	6 51.5		9 26.7		354 18.6		3 51.4		341 37.9		-2 4.4		328 38.5		-7 58.1		315 11.3		-13 24.3		301 13.2		-17 57.7	
21 0	11 41.1	289.5	9 22.3	-4.4	359 8.1	289.5	3 46.6	-4.9	346 27.2	289.3	-2 9.4	-5.0	333 27.5	289.0	-8 2.8	-4.8	319 59.9	288.6	-13 28.5	-4.2	306 1.4	288.1	-18 1.0	-3.3
20	16 30.6		9 17.9		3 57.6		3 41.7		351 16.6		-2 14.4		338 16.5		-8 7.6		324 48.5		-13 32.7		310 49.5		-18 4.3	
40	21 20.2		9 13.4		8 47.1		3 36.9		356 5.9		-2 19.4		343 5.4		-8 12.4		329 37.0		-13 36.9		315 37.7		-18 7.6	
22 0	26 9.7	289.6	9 9.0	-4.5	13 36.7	289.5	3 32.0	-4.9	0 55.2	289.3	-2 24.3	-5.0	347 54.4	289.0	-8 17.1	-4.8	334 25.6	288.5	-13 41.1	-4.2	320 25.8	288.1	-18 10.9	-3.2
20	30 59.3		9 4.5		18 26.2		3 27.1		5 44.5		-2 29.3		352 43.4		-8 21.9		339 14.1		-13 45.3		325 14.0		-18 14.1	
40	35 48.8		9 0.1		23 15.7		3 22.3		10 33.8		-2 34.3		357 32.4		-8 26.7		344 2.6		-13 49.4		330 2.1		-18 17.4	
23 0	40 38.4	289.6	8 55.6	-4.5	28 5.2	289.5	3 17.4	-4.9	15 23.1	289.3	-2 39.3	-5.0	2 21.3	289.0	-8 31.4	-4.7	348 51.2	288.5	-13 53.6	-4.1	334 50.2	288.1	-18 20.6	-3.2
20	45 27.9		8 51.1		32 54.7		3 12.5		20 12.4		-2 44.3		7 10.3		-8 36.1		353 39.7		-13 57.7		339 38.4		-18 23.8	
40	50 17.5		8 46.6		37 44.2		3 7.6		25 1.7		-2 49.2		11 59.2		-8 40.9		358 28.2		-14 1.8		344 26.5		-18 27.0	

2011 Moon

h m	19 Apr GHA ° ′	d	Dec ° ′	d′	20 Apr GHA ° ′	d	Dec ° ′	d′	21 Apr GHA ° ′	d	Dec ° ′	d′	22 Apr GHA ° ′	d	Dec ° ′	d′	23 Apr GHA ° ′	d	Dec ° ′	d′	24 Apr GHA ° ′	d	Dec ° ′	d′
0 0	349 14.6	288.1	-18 30.2	-3.1	334 49.5	287.9	-21 37.4	-2.0	320 19.1	288.0	-23 15.2	-0.7	306 6.7	288.4	-23 21.8	0.5	292 33.2	289.1	-22 5.3	1.6	279 50.4	289.8	-19 39.7	2.4
20	354 2.7		-18 33.3		339 37.4		-21 39.4		325 7.1		-23 15.9		310 55.1		-23 21.3		297 22.2		-22 3.7		284 40.2		-19 37.3	
40	358 50.8		-18 36.5		344 25.3		-21 41.4		329 55.1		-23 16.6		315 43.5		-23 20.7		302 11.3		-22 2.1		289 30.0		-19 34.8	
1 0	3 38.9	288.1	-18 39.6	-3.1	349 13.2	287.9	-21 43.3	-1.9	334 43.1	288.0	-23 17.3	-0.6	320 31.9	288.4	-23 20.2	0.6	307 0.3	289.1	-22 0.5	1.7	294 19.8	289.8	-19 32.4	2.5
20	8 27.0		-18 42.8		354 1.0		-21 45.2		339 31.1		-23 17.9		325 20.4		-23 19.6		311 49.4		-21 58.8		299 9.6		-19 29.9	
40	13 15.1		-18 45.9		358 48.9		-21 47.2		344 19.1		-23 18.5		330 8.8		-23 19.0		316 38.5		-21 57.2		303 59.5		-19 27.4	
2 0	18 3.2	288.1	-18 49.0	-3.0	3 36.8	287.9	-21 49.1	-1.9	349 7.1	288.0	-23 19.2	-0.6	334 57.2	288.5	-23 18.4	0.6	321 27.6	289.1	-21 55.5	1.7	308 49.3	289.9	-19 25.0	2.5
20	22 51.3		-18 52.0		8 24.7		-21 50.9		353 55.1		-23 19.8		339 45.7		-23 17.8		326 16.7		-21 53.9		313 39.1		-19 22.5	
40	27 39.4		-18 55.1		13 12.6		-21 52.8		358 43.1		-23 20.3		344 34.1		-23 17.2		331 5.8		-21 52.2		318 29.0		-19 20.0	
3 0	32 27.4	288.1	-18 58.1	-3.0	18 0.5	287.9	-21 54.7	-1.8	3 31.1	288.0	-23 20.9	-0.5	349 22.6	288.5	-23 16.5	0.7	335 54.9	289.1	-21 50.5	1.7	323 18.9	289.9	-19 17.4	2.5
20	37 15.5		-19 1.2		22 48.4		-21 56.5		8 19.1		-23 21.5		354 11.0		-23 15.9		340 44.0		-21 48.8		328 8.7		-19 14.9	
40	42 3.6		-19 4.2		27 36.3		-21 58.3		13 7.1		-23 22.0		358 59.5		-23 15.2		345 33.2		-21 47.1		332 58.6		-19 12.4	
4 0	46 51.6	288.1	-19 7.2	-3.0	32 24.2	287.9	-22 0.1	-1.8	17 55.2	288.0	-23 22.5	-0.5	3 48.0	288.5	-23 14.5	0.7	350 22.3	289.2	-21 45.4	1.8	337 48.5	289.9	-19 9.9	2.6
20	51 39.7		-19 10.2		37 12.1		-22 1.9		22 43.2		-23 23.0		8 36.5		-23 13.8		355 11.5		-21 43.6		342 38.4		-19 7.3	
40	56 27.8		-19 13.1		41 59.9		-22 3.6		27 31.2		-23 23.5		13 25.0		-23 13.0		0 0.7		-21 41.9		347 28.3		-19 4.7	
5 0	61 15.8	288.0	-19 16.1	-2.9	46 47.8	287.9	-22 5.4	-1.7	32 19.3	288.0	-23 23.9	-0.4	18 13.5	288.5	-23 12.3	0.8	4 49.9	289.2	-21 40.1	1.8	352 18.3	289.9	-19 2.2	2.6
20	66 3.9		-19 19.0		51 35.7		-22 7.1		37 7.3		-23 24.4		23 2.0		-23 11.5		9 39.0		-21 38.3		357 8.2		-18 59.6	
40	70 51.9		-19 22.0		56 23.6		-22 8.8		41 55.4		-23 24.8		27 50.5		-23 10.8		14 28.3		-21 36.5		1 58.2		-18 57.0	
6 0	75 39.9	288.0	-19 24.9	-2.9	61 11.5	287.9	-22 10.5	-1.6	46 43.4	288.1	-23 25.2	-0.4	32 39.1	288.5	-23 10.0	0.8	19 17.5	289.2	-21 34.7	1.8	6 48.1	290.0	-18 54.4	2.6
20	80 28.0		-19 27.7		65 59.4		-22 12.2		51 31.5		-23 25.6		37 27.6		-23 9.2		24 6.7		-21 32.9		11 38.1		-18 51.8	
40	85 16.0		-19 30.6		70 47.3		-22 13.8		56 19.5		-23 26.0		42 16.1		-23 8.3		28 55.9		-21 31.1		16 28.1		-18 49.2	
7 0	90 4.0	288.0	-19 33.5	-2.8	75 35.2	287.9	-22 15.4	-1.6	61 7.6	288.1	-23 26.3	-0.3	47 4.7	288.6	-23 7.5	0.9	33 45.2	289.3	-21 29.2	1.9	21 18.1	290.0	-18 46.6	2.7
20	94 52.1		-19 36.3		80 23.0		-22 17.1		65 55.7		-23 26.7		51 53.3		-23 6.7		38 34.4		-21 27.4		26 8.1		-18 43.9	
40	99 40.1		-19 39.1		85 10.9		-22 18.7		70 43.7		-23 27.0		56 41.8		-23 5.8		43 23.7		-21 25.5		30 58.1		-18 41.3	
8 0	104 28.1	288.0	-19 42.0	-2.8	89 58.8	287.9	-22 20.2	-1.6	75 31.8	288.1	-23 27.3	-0.3	61 30.4	288.6	-23 4.9	0.9	48 13.0	289.3	-21 23.6	1.9	35 48.1	290.0	-18 38.6	2.7
20	109 16.1		-19 44.8		94 46.7		-22 21.8		80 19.9		-23 27.6		66 19.0		-23 4.0		53 2.3		-21 21.7		40 38.1		-18 36.0	
40	114 4.1		-19 47.5		99 34.6		-22 23.4		85 8.0		-23 27.8		71 7.6		-23 3.1		57 51.6		-21 19.8		45 28.1		-18 33.3	
9 0	118 52.1	288.0	-19 50.3	-2.7	104 22.5	287.9	-22 24.9	-1.5	89 56.1	288.1	-23 28.1	-0.2	75 56.2	288.6	-23 2.2	1.0	62 40.9	289.3	-21 17.9	1.9	50 18.2	290.1	-18 30.6	2.7
20	123 40.1		-19 53.0		109 10.4		-22 26.4		94 44.2		-23 28.3		80 44.8		-23 1.2		67 30.2		-21 16.0		55 8.3		-18 27.9	
40	128 28.1		-19 55.8		113 58.3		-22 27.9		99 32.3		-23 28.5		85 33.5		-23 0.3		72 19.5		-21 14.0		59 58.3		-18 25.2	
10 0	133 16.1	288.0	-19 58.5	-2.7	118 46.2	287.9	-22 29.4	-1.4	104 20.4	288.1	-23 28.7	-0.2	90 22.1	288.7	-22 59.3	1.0	77 8.8	289.4	-21 12.1	2.0	64 48.4	290.1	-18 22.5	2.7
20	138 4.1		-20 1.2		123 34.1		-22 30.8		109 8.5		-23 28.9		95 10.7		-22 58.3		81 58.2		-21 10.1		69 38.5		-18 19.8	
40	142 52.1		-20 3.9		128 21.9		-22 32.3		113 56.7		-23 29.1		99 59.4		-22 57.3		86 47.6		-21 8.1		74 28.6		-18 17.0	
11 0	147 40.1	288.0	-20 6.5	-2.6	133 9.8	287.9	-22 33.7	-1.4	118 44.8	288.1	-23 29.2	-0.1	104 48.1	288.7	-22 56.3	1.1	91 36.9	289.4	-21 6.1	2.0	79 18.7	290.1	-18 14.3	2.7
20	152 28.1		-20 9.2		137 57.7		-22 35.1		123 32.9		-23 29.4		109 36.7		-22 55.2		96 26.3		-21 4.1		84 8.8		-18 11.6	
40	157 16.0		-20 11.8		142 45.6		-22 36.5		128 21.1		-23 29.5		114 25.4		-22 54.2		101 15.7		-21 2.1		88 58.9		-18 8.8	
12 0	162 4.0	288.0	-20 14.4	-2.6	147 33.5	287.9	-22 37.8	-1.3	133 9.2	288.2	-23 29.6	-0.1	119 14.1	288.7	-22 53.1	1.1	106 5.1	289.4	-21 0.1	2.0	93 49.1	290.2	-18 6.1	2.8
20	166 52.0		-20 17.0		152 21.4		-22 39.2		137 57.4		-23 29.7		124 2.8		-22 52.0		110 54.5		-20 58.1		98 39.2		-18 3.3	
40	171 39.9		-20 19.6		157 9.3		-22 40.5		142 45.5		-23 29.7		128 51.5		-22 51.0		115 43.9		-20 56.0		103 29.4		-18 0.5	
13 0	176 27.9	288.0	-20 22.2	-2.5	161 57.2	287.9	-22 41.8	-1.3	147 33.7	288.2	-23 29.8	0.0	133 40.2	288.7	-22 49.8	1.1	120 33.4	289.5	-20 54.0	2.1	108 19.6	290.2	-17 57.7	2.8
20	181 15.9		-20 24.7		166 45.1		-22 43.1		152 21.9		-23 29.8		138 28.9		-22 48.7		125 22.8		-20 51.9		113 9.7		-17 54.9	
40	186 3.8		-20 27.3		171 33.0		-22 44.4		157 10.0		-23 29.8		143 17.7		-22 47.6		130 12.3		-20 49.8		117 59.9		-17 52.1	
14 0	190 51.8	288.0	-20 29.8	-2.5	176 20.9	287.9	-22 45.7	-1.2	161 58.2	288.2	-23 29.8	0.0	148 6.4	288.8	-22 46.4	1.2	135 1.7	289.5	-20 47.7	2.1	122 50.1	290.2	-17 49.3	2.8
20	195 39.8		-20 32.3		181 8.8		-22 46.9		166 46.4		-23 29.8		152 55.2		-22 45.3		139 51.2		-20 45.6		127 40.3		-17 46.5	
40	200 27.7		-20 34.8		185 56.7		-22 48.1		171 34.6		-23 29.7		157 43.9		-22 44.1		144 40.7		-20 43.5		132 30.5		-17 43.6	
15 0	205 15.7	287.9	-20 37.2	-2.4	190 44.7	287.9	-22 49.3	-1.2	176 22.8	288.2	-23 29.7	0.1	162 32.7	288.8	-22 42.9	1.2	149 30.2	289.5	-20 41.4	2.2	137 20.8	290.2	-17 40.8	2.9
20	210 3.6		-20 39.7		195 32.6		-22 50.5		181 11.0		-23 29.6		167 21.5		-22 41.7		154 19.7		-20 39.2		142 11.0		-17 38.0	
40	214 51.5		-20 42.1		200 20.5		-22 51.7		185 59.2		-23 29.5		172 10.3		-22 40.5		159 9.2		-20 37.1		147 1.2		-17 35.1	
16 0	219 39.5	287.9	-20 44.5	-2.4	205 8.4	287.9	-22 52.9	-1.1	190 47.4	288.2	-23 29.4	0.1	176 59.1	288.8	-22 39.2	1.3	163 58.7	289.5	-20 34.9	2.2	151 51.5	290.3	-17 32.2	2.9
20	224 27.4		-20 46.9		209 56.3		-22 54.0		195 35.7		-23 29.3		181 47.9		-22 38.0		168 48.2		-20 32.7		156 41.8		-17 29.4	
40	229 15.4		-20 49.3		214 44.2		-22 55.1		200 23.9		-23 29.1		186 36.7		-22 36.7		173 37.8		-20 30.5		161 32.0		-17 26.5	
17 0	234 3.3	287.9	-20 51.7	-2.3	219 32.2	287.9	-22 56.2	-1.1	205 12.1	288.3	-23 29.0	0.2	191 25.5	288.8	-22 35.4	1.3	178 27.3	289.6	-20 28.3	2.2	166 22.3	290.3	-17 23.6	2.9
20	238 51.2		-20 54.0		224 20.1		-22 57.3		210 0.4		-23 28.8		196 14.4		-22 34.1		183 16.9		-20 26.1		171 12.6		-17 20.7	
40	243 39.2		-20 56.4		229 8.0		-22 58.4		214 48.6		-23 28.6		201 3.2		-22 32.8		188 6.5		-20 23.9		176 2.9		-17 17.8	
18 0	248 27.1	287.9	-20 58.7	-2.3	233 55.9	287.9	-22 59.4	-1.0	219 36.9	288.3	-23 28.4	0.2	205 52.1	288.9	-22 31.5	1.4	192 56.1	289.6	-20 21.7	2.3	180 53.2	290.3	-17 14.9	2.9
20	253 15.0		-21 1.0		238 43.9		-23 0.4		224 25.1		-23 28.2		210 40.9		-22 30.1		197 45.7		-20 19.4		185 43.5		-17 12.0	
40	258 2.9		-21 3.2		243 31.8		-23 1.4		229 13.4		-23 27.9		215 29.8		-22 28.8		202 35.3		-20 17.2		190 33.9		-17 9.0	
19 0	262 50.9	287.9	-21 5.5	-2.2	248 19.7	287.9	-23 2.4	-1.0	234 1.7	288.3	-23 27.7	0.3	220 18.7	288.9	-22 27.4	1.4	207 24.9	289.6	-20 14.9	2.3	195 24.2	290.4	-17 6.1	3.0
20	267 38.8		-21 7.8		253 7.7		-23 3.4		238 50.0		-23 27.4		225 7.6		-22 26.0		212 14.5		-20 12.6		200 14.6		-17 3.1	
40	272 26.7		-21 10.0		257 55.6		-23 4.4		243 38.3		-23 27.1		229 56.5		-22 24.6		217 4.2		-20 10.4		205 4.9		-17 0.2	
20 0	277 14.6	287.9	-21 12.2	-2.2	262 43.6	287.9	-23 5.3	-0.9	248 26.6	288.3	-23 26.8	0.3	234 45.4	288.9	-22 23.2	1.4	221 53.8	289.7	-20 8.1	2.3	209 55.3	290.4	-16 57.2	3.0
20	282 2.5		-21 14.4		267 31.5		-23 6.2		253 14.9		-23 26.5		239 34.3		-22 21.8		226 43.5		-20 5.8		214 45.7		-16 54.3	
40	286 50.4		-21 16.6		272 19.4		-23 7.1		258 3.2		-23 26.1		244 23.3		-22 20.4		231 33.2		-20 3.4		219 36.1		-16 51.3	
21 0	291 38.3	287.9	-21 18.7	-2.1	277 7.4	288.0	-23 8.0	-0.9	262 51.5	288.3	-23 25.8	0.4	249 12.2	289.0	-22 18.9	1.5	236 22.8	289.7	-20 1.1	2.3	224 26.5	290.4	-16 48.3	3.0
20	296 26.2		-21 20.9		281 55.4		-23 8.9		267 39.8		-23 25.4		254 1.2		-22 17.5		241 12.5		-19 58.8		229 16.9		-16 45.3	
40	301 14.2		-21 23.0		286 43.3		-23 9.7		272 28.2		-23 25.0		258 50.1		-22 16.0		246 2.2		-19 56.4		234 7.3		-16 42.3	
22 0	306 2.1	287.9	-21 25.1	-2.1	291 31.3	288.0	-23 10.6	-0.8	277 16.5	288.4	-23 24.6	0.4	263 39.1	289.0	-22 14.5	1.5	250 51.9	289.7	-19 54.1	2.4	238 57.7	290.4	-16 39.3	3.0
20	310 50.0		-21 27.2		296 19.2		-23 11.4		282 4.9		-23 24.2		268 28.1		-22 13.0		255 41.7		-19 51.7		243 48.1		-16 36.3	
40	315 37.9		-21 29.3		301 7.2		-23 12.2		286 53.2		-23 23.7		273 17.1		-22 11.5		260 31.4		-19 49.3		248 38.6		-16 33.3	
23 0	320 25.8	287.9	-21 31.3	-2.0	305 55.2	288.0	-23 13.0	-0.7	291 41.6	288.4	-23 23.3	0.5	278 6.1	289.0	-22 9.9	1.5	265 21.1	289.8	-19 46.9	2.4	253 29.0	290.5	-16 30.2	3.0
20	325 13.7		-21 33.4		310 43.1		-23 13.7		296 30.0		-23 22.8		282 55.1		-22 8.4		270 10.9		-19 44.5		258 19.5		-16 27.2	
40	330 1.6		-21 35.4		315 31.1		-23 14.5		301 18.3		-23 22.3		287 44.1		-22 6.8		275 0.7		-19 42.1		263 10.0		-16 24.2	

2011 Moon

	25 Apr						26 Apr						27 Apr						28 Apr						29 Apr						30 Apr					
	GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec		
h m	°	'	d	°	'	d '	°	'	d	°	'	d '	°	'	d	°	'	d '	°	'	d	°	'	d '	°	'	d	°	'	d '	°	'	d	°	'	d '
0 0	268	0.5	290.5	-16	21.1	3.1	256	57.2	291.1	-12	24.5	3.5	246	30.3	291.5	-8	2.5	3.8	236	27.2	291.7	-3	25.9	3.9	226	35.1	291.8	1	16.1	3.9	216	41.7	291.7	5	54.8	3.8
20	272	50.9		-16	18.1		261	48.3		-12	21.0		251	21.8		-7	58.8		241	18.9		-3	22.0		231	26.9		1	20.0		221	33.4		5	58.6	
40	277	41.4		-16	15.0		266	39.4		-12	17.5		256	13.3		-7	55.0		246	10.6		-3	18.1		236	18.7		1	23.9		226	25.1		6	2.4	
1 0	282	31.9	290.5	-16	11.9	3.1	271	30.5	291.1	-12	14.0	3.5	261	4.8	291.5	-7	51.2	3.8	251	2.4	291.7	-3	14.2	3.9	241	10.5	291.8	1	27.8	3.9	231	16.8	291.7	6	6.2	3.8
20	287	22.5		-16	8.8		276	21.6		-12	10.5		265	56.3		-7	47.5		255	54.1		-3	10.3		246	2.3		1	31.7		236	8.5		6	10.0	
40	292	13.0		-16	5.8		281	12.7		-12	7.0		270	47.8		-7	43.7		260	45.8		-3	6.4		250	54.1		1	35.6		241	0.2		6	13.8	
2 0	297	3.5	290.6	-16	2.7	3.1	286	3.8	291.1	-12	3.4	3.5	275	39.3	291.5	-7	39.9	3.8	265	37.6	291.7	-3	2.5	3.9	255	45.9	291.8	1	39.5	3.9	245	51.9	291.7	6	17.6	3.8
20	301	54.1		-15	59.6		290	54.9		-11	59.9		280	30.8		-7	36.1		270	29.3		-2	58.6		260	37.7		1	43.4		250	43.5		6	21.4	
40	306	44.6		-15	56.4		295	46.0		-11	56.4		285	22.3		-7	32.3		275	21.1		-2	54.7		265	29.5		1	47.4		255	35.2		6	25.2	
3 0	311	35.2	290.6	-15	53.3	3.1	300	37.1	291.1	-11	52.9	3.5	290	13.9	291.5	-7	28.6	3.8	280	12.8	291.7	-2	50.8	3.9	270	21.3	291.8	1	51.3	3.9	260	26.9	291.7	6	28.9	3.8
20	316	25.7		-15	50.2		305	28.3		-11	49.3		295	5.4		-7	24.8		285	4.6		-2	46.9		275	13.1		1	55.2		265	18.6		6	32.7	
40	321	16.3		-15	47.1		310	19.4		-11	45.8		299	56.9		-7	21.0		289	56.3		-2	43.0		280	4.9		1	59.1		270	10.2		6	36.5	
4 0	326	6.9	290.6	-15	43.9	3.1	315	10.5	291.2	-11	42.3	3.6	304	48.5	291.5	-7	17.2	3.8	294	48.1	291.8	-2	39.1	3.9	284	56.6	291.8	2	3.0	3.9	275	1.9	291.7	6	40.3	3.8
20	330	57.5		-15	40.8		320	1.7		-11	38.7		309	40.0		-7	13.4		299	39.8		-2	35.2		289	48.4		2	6.9		279	53.6		6	44.1	
40	335	48.1		-15	37.7		324	52.9		-11	35.2		314	31.5		-7	9.6		304	31.6		-2	31.2		294	40.2		2	10.8		284	45.2		6	47.8	
5 0	340	38.7	290.6	-15	34.5	3.2	329	44.0	291.2	-11	31.6	3.6	319	23.1	291.6	-7	5.8	3.8	309	23.3	291.8	-2	27.3	3.9	299	32.0	291.8	2	14.7	3.9	289	36.9	291.6	6	51.6	3.8
20	345	29.3		-15	31.3		334	35.2		-11	28.0		324	14.6		-7	2.0		314	15.1		-2	23.4		304	23.8		2	18.6		294	28.5		6	55.4	
40	350	20.0		-15	28.2		339	26.4		-11	24.5		329	6.2		-6	58.2		319	6.9		-2	19.5		309	15.6		2	22.5		299	20.2		6	59.1	
6 0	355	10.6	290.7	-15	25.0	3.2	344	17.6	291.2	-11	20.9	3.6	333	57.8	291.6	-6	54.4	3.8	323	58.6	291.8	-2	15.6	3.9	314	7.4	291.8	2	26.4	3.9	304	11.8	291.6	7	2.9	3.8
20	0	1.3		-15	21.8		349	8.8		-11	17.3		338	49.3		-6	50.6		328	50.4		-2	11.7		318	59.2		2	30.3		309	3.5		7	6.7	
40	4	51.9		-15	18.6		353	60.0		-11	13.8		343	40.9		-6	46.7		333	42.1		-2	7.8		323	50.9		2	34.2		313	55.1		7	10.4	
7 0	9	42.6	290.7	-15	15.4	3.2	358	51.2	291.2	-11	10.2	3.6	348	32.5	291.6	-6	42.9	3.8	338	33.9	291.8	-2	3.8	3.9	328	42.7	291.8	2	38.1	3.9	318	46.7	291.6	7	14.2	3.7
20	14	33.3		-15	12.2		3	42.4		-11	6.6		353	24.1		-6	39.1		343	25.7		-1	59.9		333	34.5		2	42.0		323	38.4		7	17.9	
40	19	23.9		-15	9.0		8	33.6		-11	3.0		358	15.6		-6	35.3		348	17.5		-1	56.0		338	26.3		2	45.9		328	30.0		7	21.7	
8 0	24	14.6	290.7	-15	5.8	3.2	13	24.8	291.2	-10	59.4	3.6	3	7.2	291.6	-6	31.5	3.8	353	9.2	291.8	-1	52.1	3.9	343	18.1	291.8	2	49.8	3.9	333	21.6	291.6	7	25.4	3.7
20	29	5.3		-15	2.6		18	16.0		-10	55.8		7	58.8		-6	27.7		358	1.0		-1	48.2		348	9.9		2	53.7		338	13.3		7	29.2	
40	33	56.0		-14	59.3		23	7.3		-10	52.2		12	50.4		-6	23.8		2	52.8		-1	44.3		353	1.6		2	57.5		343	4.9		7	32.9	
9 0	38	46.8	290.7	-14	56.1	3.2	27	58.5	291.3	-10	48.6	3.6	17	42.0	291.6	-6	20.0	3.8	7	44.5	291.8	-1	40.3	3.9	357	53.4	291.8	3	1.4	3.9	347	56.5	291.6	7	36.6	3.7
20	43	37.5		-14	52.9		32	49.8		-10	45.0		22	33.6		-6	16.2		12	36.3		-1	36.4		2	45.2		3	5.3		352	48.1		7	40.4	
40	48	28.2		-14	49.6		37	41.0		-10	41.4		27	25.2		-6	12.3		17	28.1		-1	32.5		7	37.0		3	9.2		357	39.7		7	44.1	
10 0	53	19.0	290.8	-14	46.4	3.3	42	32.3	291.3	-10	37.7	3.6	32	16.8	291.6	-6	8.5	3.8	22	19.9	291.8	-1	28.6	3.9	12	28.7	291.8	3	13.1	3.9	2	31.3	291.6	7	47.8	3.7
20	58	9.7		-14	43.1		47	23.6		-10	34.1		37	8.4		-6	4.7		27	11.6		-1	24.7		17	20.5		3	17.0		7	22.9		7	51.6	
40	63	0.5		-14	39.8		52	14.8		-10	30.5		42	0.1		-6	0.8		32	3.4		-1	20.7		22	12.3		3	20.9		12	14.5		7	55.3	
11 0	67	51.2	290.8	-14	36.6	3.3	57	6.1	291.3	-10	26.9	3.6	46	51.7	291.6	-5	57.0	3.8	36	55.2	291.8	-1	16.8	3.9	27	4.0	291.8	3	24.7	3.9	17	6.1	291.6	7	59.0	3.7
20	72	42.0		-14	33.3		61	57.4		-10	23.2		51	43.3		-5	53.1		41	47.0		-1	12.9		31	55.8		3	28.6		21	57.7		8	2.7	
40	77	32.8		-14	30.0		66	48.7		-10	19.6		56	34.9		-5	49.3		46	38.8		-1	9.0		36	47.6		3	32.5		26	49.3		8	6.4	
12 0	82	23.6	290.8	-14	26.7	3.3	71	40.0	291.3	-10	16.0	3.7	61	26.5	291.6	-5	45.5	3.9	51	30.6	291.8	-1	5.1	3.9	41	39.4	291.8	3	36.4	3.9	31	40.9	291.6	8	10.1	3.7
20	87	14.4		-14	23.4		76	31.3		-10	12.3		66	18.2		-5	41.6		56	22.3		-1	1.1		46	31.1		3	40.3		36	32.5		8	13.8	
40	92	5.2		-14	20.1		81	22.6		-10	8.7		71	9.8		-5	37.8		61	14.1		-0	57.2		51	22.9		3	44.1		41	24.1		8	17.5	
13 0	96	56.0	290.8	-14	16.8	3.3	86	13.9	291.3	-10	5.0	3.7	76	1.5	291.6	-5	33.9	3.9	66	5.9	291.8	-0	53.3	3.9	56	14.6	291.8	3	48.0	3.9	46	15.6	291.6	8	21.2	3.7
20	101	46.8		-14	13.5		91	5.2		-10	1.3		80	53.1		-5	30.1		70	57.7		-0	49.4		61	6.4		3	51.9		51	7.2		8	24.9	
40	106	37.7		-14	10.2		95	56.6		-9	57.7		85	44.7		-5	26.2		75	49.5		-0	45.5		65	58.2		3	55.7		55	58.8		8	28.6	
14 0	111	28.5	290.9	-14	6.8	3.3	100	47.9	291.3	-9	54.0	3.7	90	36.4	291.7	-5	22.3	3.8	80	41.3	291.8	-0	41.5	3.9	70	49.9	291.8	3	59.6	3.9	60	50.4	291.6	8	32.3	3.7
20	116	19.3		-14	3.5		105	39.2		-9	50.4		95	28.0		-5	18.5		85	33.1		-0	37.6		75	41.7		4	3.5		65	41.9		8	36.0	
40	121	10.2		-14	0.2		110	30.6		-9	46.7		100	19.7		-5	14.6		90	24.9		-0	33.7		80	33.4		4	7.3		70	33.5		8	39.7	
15 0	126	1.1	290.9	-13	56.8	3.4	115	21.9	291.4	-9	43.0	3.7	105	11.4	291.7	-5	10.8	3.9	95	16.7	291.8	-0	29.8	3.9	85	25.2	291.7	4	11.2	3.9	75	25.0	291.5	8	43.4	3.7
20	130	51.9		-13	53.5		120	13.3		-9	39.3		110	3.0		-5	6.9		100	8.4		-0	25.8		90	16.9		4	15.1		80	16.6		8	47.0	
40	135	42.8		-13	50.1		125	4.6		-9	35.6		114	54.7		-5	3.0		105	0.2		-0	21.9		95	8.7		4	18.9		85	8.1		8	50.7	
16 0	140	33.7	290.9	-13	46.7	3.4	129	56.0	291.4	-9	32.0	3.7	119	46.4	291.7	-4	59.2	3.9	109	52.0	291.8	-0	18.0	3.9	100	0.4	291.7	4	22.8	3.8	89	59.7	291.5	8	54.4	3.6
20	145	24.6		-13	43.4		134	47.4		-9	28.3		124	38.0		-4	55.3		114	43.8		-0	14.1		104	52.2		4	26.6		94	51.2		8	58.0	
40	150	15.5		-13	40.0		139	38.7		-9	24.6		129	29.7		-4	51.4		119	35.6		-0	10.1		109	43.9		4	30.5		99	42.7		9	1.7	
17 0	155	6.4	290.9	-13	36.6	3.4	144	30.1	291.4	-9	20.9	3.7	134	21.4	291.7	-4	47.6	3.9	124	27.4	291.8	-0	6.2	3.9	114	35.7	291.7	4	34.3	3.9	104	34.3	291.5	9	5.3	3.7
20	159	57.3		-13	33.2		149	21.5		-9	17.2		139	13.1		-4	43.7		129	19.2		-0	2.3		119	27.4		4	38.2		109	25.8		9	9.0	
40	164	48.3		-13	29.9		154	12.9		-9	13.5		144	4.7		-4	39.8		134	11.0		0	1.6		124	19.1		4	42.0		114	17.3		9	12.6	
18 0	169	39.2	290.9	-13	26.5	3.4	159	4.3	291.4	-9	9.8	3.7	148	56.4	291.7	-4	35.9	3.9	139	2.8	291.8	0	5.5	3.9	129	10.9	291.7	4	45.9	3.8	119	8.9	291.5	9	16.3	3.6
20	174	30.1		-13	23.1		163	55.7		-9	6.1		153	48.1		-4	32.1		143	54.6		0	9.5		134	2.6		4	49.7		124	0.4		9	19.9	
40	179	21.1		-13	19.7		168	47.1		-9	2.3		158	39.8		-4	28.2		148	46.4		0	13.4		138	54.3		4	53.6		128	51.9		9	23.6	
19 0	184	12.0	291.0	-13	16.2	3.4	173	38.5	291.4	-8	58.6	3.7	163	31.5	291.7	-4	24.3	3.9	153	38.2	291.8	0	17.3	3.9	143	46.1	291.7	4	57.4	3.8	133	43.4	291.5	9	27.2	3.6
20	189	3.0		-13	12.8		178	29.9		-8	54.9		168	23.2		-4	20.4		158	30.0		0	21.2		148	37.8		5	1.3		138	34.9		9	30.8	
40	193	54.0		-13	9.4		183	21.3		-8	51.2		173	14.9		-4	16.5		163	21.8		0	25.1		153	29.5		5	5.1		143	26.4		9	34.5	
20 0	198	44.9	291.0	-13	6.0	3.4	188	12.8	291.4	-8	47.5	3.7	178	6.6	291.7	-4	12.6	3.9	168	13.6	291.8	0	29.1	3.9	158	21.2	291.7	5	8.9	3.8	148	17.9	291.5	9	38.1	3.6
20	203	35.9		-13	2.6		193	4.2		-8	43.7		182	58.3		-4	8.8		173	5.4		0	33.0		163	13.0		5	12.8		153	9.4		9	41.7	
40	208	26.9		-12	59.1		197	55.6		-8	40.0		187	50.0		-4	4.9		177	57.2		0	36.9		168	4.7		5	16.6		158	0.9		9	45.3	
21 0	213	17.9	291.0	-12	55.7	3.5	202	47.1	291.5	-8	36.3	3.8	192	41.7	291.7	-4	1.0	3.9	182	49.0	291.8	0	40.8	3.9	172	56.4	291.7	5	20.4	3.8	162	52.3	291.5	9	48.9	3.6
20	218	8.9		-12	52.2		207	38.5		-8	32.5		197	33.4		-3	57.1		187	40.8		0	44.7		177	48.1		5	24.2		167	43.8		9	52.5	
40	222	59.9		-12	48.8		212	30.0		-8	28.8		202	25.1		-3	53.2		192	32.6		0	48.7		182	39.8		5	28.1		172	35.3		9	56.1	
22 0	227	51.0	291.0	-12	45.3	3.5	217	21.4	291.5	-8	25.0	3.7	207	16.8	291.7	-3	49.3	3.9	197	24.4	291.8	0	52.6	3.9	187	31.5	291.7	5	31.9	3.8	177	26.8	291.5	9	59.7	3.6
20	232	42.0		-12	41.9		222	12.9		-8	21.3		212	8.6		-3	45.4		202	16.1		0	56.5		192	23.2		5	35.7		182	18.2		10	3.3	
40	237	33.0		-12	38.4		227	4.4		-8	17.6		217	0.3		-3	41.5		207	7.9		1	0.4		197	14.9		5	39.5		187	9.7		10	6.9	
23 0	242	24.1	291.1	-12	34.9	3.5	231	55.8	291.5	-8	13.8	3.8	221	52.0	291.7	-3	37.6	3.9	211	59.7	291.8	1	4.3	3.9	202	6.7	291.7	5	43.3	3.8	192	1.2	291.4	10	10.5	3.6
20	247	15.1		-12	31.4		236	47.3		-8	10.0		226	43.7		-3	33.7		216	51.5		1	8.2		206	58.4		5	47.2		196	52.6		10	14.1	
40	252	6.2		-12	28.0		241	38.8		-8	6.3		231	35.4		-3	29.8		221	43.3		1	12.2		211	50.1		5	51.0		201	44.1		10	17.7	

2011 Moon

	1 May						2 May						3 May						4 May						5 May						6 May					
	GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec		
h m	o	'	d	o	'	d '	o	'	d	o	'	d '	o	'	d	o	'	d '	o	'	d	o	'	d '	o	'	d	o	'	d '	o	'	d	o	'	d '
0 0	206	35.5	291.4	10	21.3	3.6	196	6.3	291.1	14	25.8	3.2	185	6.4	290.6	17	57.7	2.6	173	31.6	290.1	20	45.3	2.0	161	23.2	289.7	22	37.5	1.1	148	47.8	289.4	23	24.3	0.2
20	211	26.9		10	24.8		200	57.4		14	29.0		189	57.0		18	0.3		178	21.7		20	47.3		166	12.8		22	38.6		153	37.2		23	24.5	
40	216	18.4		10	28.4		205	48.4		14	32.2		194	47.5		18	3.0		183	11.8		20	49.2		171	2.5		22	39.7		158	26.6		23	24.6	
1 0	221	9.8	291.4	10	32.0	3.5	210	39.5	291.0	14	35.4	3.2	199	38.1	290.6	18	5.6	2.6	188	1.9	290.1	20	51.2	1.9	175	52.1	289.6	22	40.8	1.1	163	15.9	289.4	23	24.8	0.1
20	226	1.2		10	35.5		215	30.5		14	38.5		204	28.7		18	8.2		192	52.0		20	53.1		180	41.8		22	41.9		168	5.3		23	24.9	
40	230	52.7		10	39.1		220	21.5		14	41.7		209	19.3		18	10.9		197	42.1		20	55.0		185	31.5		22	42.9		172	54.7		23	25.0	
2 0	235	44.1	291.4	10	42.6	3.5	225	12.6	291.0	14	44.9	3.1	214	9.8	290.5	18	13.5	2.6	202	32.2	290.1	20	56.9	1.9	190	21.1	289.6	22	44.0	1.0	177	44.0	289.4	23	25.1	0.0
20	240	35.5		10	46.2		230	3.6		14	48.0		219	0.4		18	16.1		207	22.2		20	58.8		195	10.7		22	45.0		182	33.4		23	25.1	
40	245	26.9		10	49.7		234	54.6		14	51.2		223	50.9		18	18.7		212	12.3		21	0.7		200	0.4		22	46.0		187	22.7		23	25.2	
3 0	250	18.3	291.4	10	53.2	3.5	239	45.6	291.0	14	54.3	3.1	228	41.5	290.5	18	21.3	2.6	217	2.3	290.0	21	2.6	1.9	204	50.0	289.6	22	47.1	1.0	192	12.1	289.3	23	25.2	0.0
20	255	9.7		10	56.8		244	36.6		14	57.4		233	32.0		18	23.8		221	52.4		21	4.5		209	39.6		22	48.1		197	1.4		23	25.3	
40	260	1.1		11	0.3		249	27.6		15	0.6		238	22.5		18	26.4		226	42.4		21	6.3		214	29.2		22	49.1		201	50.8		23	25.3	
4 0	264	52.5	291.4	11	3.8	3.5	254	18.6	291.0	15	3.7	3.1	243	13.0	290.5	18	29.0	2.5	231	32.4	290.0	21	8.2	1.8	219	18.9	289.6	22	50.0	1.0	206	40.1	289.3	23	25.3	0.0
20	269	43.9		11	7.3		259	9.6		15	6.8		248	3.5		18	31.5		236	22.5		21	10.0		224	8.5		22	51.0		211	29.4		23	25.3	
40	274	35.2		11	10.8		264	0.6		15	9.9		252	54.0		18	34.1		241	12.5		21	11.8		228	58.1		22	51.9		216	18.8		23	25.3	
5 0	279	26.6	291.4	11	14.4	3.5	268	51.5	291.0	15	13.0	3.1	257	44.5	290.5	18	36.6	2.5	246	2.5	290.0	21	13.6	1.8	233	47.7	289.6	22	52.9	0.9	221	8.1	289.3	23	25.2	-0.1
20	284	18.0		11	17.9		273	42.5		15	16.1		262	35.0		18	39.1		250	52.5		21	15.4		238	37.3		22	53.8		225	57.4		23	25.2	
40	289	9.3		11	21.4		278	33.5		15	19.2		267	25.5		18	41.7		255	42.5		21	17.2		243	26.9		22	54.7		230	46.8		23	25.1	
6 0	294	0.7	291.3	11	24.8	3.5	283	24.4	290.9	15	22.3	3.1	272	16.0	290.5	18	44.2	2.5	260	32.5	290.0	21	19.0	1.8	248	16.4	289.6	22	55.6	0.9	235	36.1	289.3	23	25.0	-0.1
20	298	52.1		11	28.3		288	15.4		15	25.3		277	6.5		18	46.7		265	22.5		21	20.8		253	6.0		22	56.5		240	25.4		23	24.9	
40	303	43.4		11	31.8		293	6.3		15	28.4		281	56.9		18	49.2		270	12.5		21	22.5		257	55.6		22	57.4		245	14.7		23	24.8	
7 0	308	34.8	291.3	11	35.3	3.5	297	57.3	290.9	15	31.5	3.0	286	47.4	290.4	18	51.6	2.5	275	2.5	290.0	21	24.3	1.7	262	45.2	289.6	22	58.2	0.8	250	4.1	289.3	23	24.7	-0.2
20	313	26.1		11	38.8		302	48.2		15	34.5		291	37.8		18	54.1		279	52.4		21	26.0		267	34.7		22	59.1		254	53.4		23	24.6	
40	318	17.4		11	42.2		307	39.1		15	37.6		296	28.3		18	56.6		284	42.4		21	27.7		272	24.3		22	59.9		259	42.7		23	24.4	
8 0	323	8.8	291.3	11	45.7	3.5	312	30.0	290.9	15	40.6	3.0	301	18.7	290.4	18	59.0	2.4	289	32.3	289.9	21	29.4	1.7	277	13.9	289.5	23	0.7	0.8	264	32.0	289.3	23	24.2	-0.2
20	328	0.1		11	49.2		317	20.9		15	43.6		306	9.1		19	1.5		294	22.3		21	31.1		282	3.4		23	1.5		269	21.3		23	24.1	
40	332	51.4		11	52.6		322	11.8		15	46.7		310	59.6		19	3.9		299	12.2		21	32.8		286	53.0		23	2.3		274	10.6		23	23.9	
9 0	337	42.7	291.3	11	56.1	3.4	327	2.7	290.9	15	49.7	3.0	315	50.0	290.4	19	6.3	2.4	304	2.2	289.9	21	34.5	1.6	291	42.5	289.5	23	3.1	0.8	278	59.9	289.3	23	23.7	-0.3
20	342	34.0		11	59.5		331	53.6		15	52.7		320	40.4		19	8.8		308	52.1		21	36.1		296	32.0		23	3.9		283	49.3		23	23.4	
40	347	25.3		12	3.0		336	44.5		15	55.7		325	30.8		19	11.2		313	42.0		21	37.8		301	21.6		23	4.6		288	38.6		23	23.2	
10 0	352	16.6	291.3	12	6.4	3.4	341	35.4	290.9	15	58.7	3.0	330	21.2	290.4	19	13.6	2.4	318	31.9	289.9	21	39.4	1.6	306	11.1	289.5	23	5.4	0.7	293	27.9	289.3	23	22.9	-0.3
20	357	7.9		12	9.8		346	26.3		16	1.7		335	11.6		19	15.9		323	21.8		21	41.0		311	0.6		23	6.1		298	17.2		23	22.7	
40	1	59.2		12	13.3		351	17.1		16	4.7		340	2.0		19	18.3		328	11.8		21	42.7		315	50.2		23	6.8		303	6.5		23	22.4	
11 0	6	50.5	291.3	12	16.7	3.4	356	8.0	290.8	16	7.6	3.0	344	52.3	290.4	19	20.7	2.3	333	1.7	289.9	21	44.3	1.6	320	39.7	289.5	23	7.5	0.7	307	55.8	289.3	23	22.1	-0.3
20	11	41.8		12	20.1		0	58.8		16	10.6		349	42.7		19	23.1		337	51.5		21	45.9		325	29.2		23	8.2		312	45.0		23	21.8	
40	16	33.1		12	23.5		5	49.7		16	13.6		354	33.1		19	25.4		342	41.4		21	47.4		330	18.7		23	8.9		317	34.3		23	21.5	
12 0	21	24.3	291.3	12	26.9	3.4	10	40.5	290.8	16	16.5	2.9	359	23.4	290.3	19	27.7	2.3	347	31.3	289.9	21	49.0	1.5	335	8.2	289.5	23	9.6	0.6	322	23.6	289.3	23	21.1	-0.3
20	26	15.6		12	30.3		15	31.4		16	19.5		4	13.8		19	30.1		352	21.2		21	50.6		339	57.7		23	10.2		327	12.9		23	20.8	
40	31	6.8		12	33.7		20	22.2		16	22.4		9	4.1		19	32.4		357	11.1		21	52.1		344	47.2		23	10.8		332	2.2		23	20.4	
13 0	35	58.1	291.2	12	37.1	3.4	25	13.0	290.8	16	25.3	2.9	13	54.4	290.3	19	34.7	2.3	2	0.9	289.9	21	53.6	1.5	349	36.7	289.5	23	11.5	0.6	336	51.5	289.3	23	20.1	-0.4
20	40	49.3		12	40.5		30	3.8		16	28.3		18	44.8		19	37.0		6	50.8		21	55.2		354	26.2		23	12.1		341	40.8		23	19.7	
40	45	40.6		12	43.9		34	54.6		16	31.2		23	35.1		19	39.3		11	40.6		21	56.7		359	15.7		23	12.7		346	30.1		23	19.3	
14 0	50	31.8	291.2	12	47.2	3.4	39	45.4	290.8	16	34.1	2.9	28	25.4	290.3	19	41.6	2.3	16	30.5	289.8	21	58.2	1.5	4	5.1	289.5	23	13.2	0.6	351	19.4	289.3	23	18.8	-0.4
20	55	23.1		12	50.6		44	36.2		16	37.0		33	15.7		19	43.9		21	20.3		21	59.7		8	54.6		23	13.8		356	8.6		23	18.4	
40	60	14.3		12	54.0		49	27.0		16	39.9		38	6.0		19	46.1		26	10.1		22	1.1		13	44.1		23	14.4		0	57.9		23	18.0	
15 0	65	5.5	291.2	12	57.3	3.4	54	17.8	290.8	16	42.8	2.9	42	56.3	290.3	19	48.4	2.2	30	60.0	289.8	22	2.6	1.4	18	33.6	289.5	23	14.9	0.5	5	47.2	289.3	23	17.5	-0.5
20	69	56.7		13	0.7		59	8.6		16	45.6		47	46.6		19	50.6		35	49.8		22	4.0		23	23.0		23	15.4		10	36.5		23	17.0	
40	74	47.9		13	4.0		63	59.3		16	48.5		52	36.9		19	52.8		40	39.6		22	5.5		28	12.5		23	15.9		15	25.7		23	16.5	
16 0	79	39.1	291.2	13	7.4	3.3	68	50.1	290.7	16	51.4	2.8	57	27.1	290.3	19	55.1	2.2	45	29.4	289.8	22	6.9	1.4	33	1.9	289.4	23	16.4	0.5	20	15.0	289.3	23	16.0	-0.5
20	84	30.3		13	10.7		73	40.9		16	54.2		62	17.4		19	57.3		50	19.2		22	8.3		37	51.4		23	16.9		25	4.3		23	15.5	
40	89	21.5		13	14.0		78	31.6		16	57.1		67	7.7		19	59.5		55	9.0		22	9.7		42	40.8		23	17.4		29	53.6		23	15.0	
17 0	94	12.7	291.2	13	17.4	3.3	83	22.3	290.7	16	59.9	2.8	71	57.9	290.2	20	1.7	2.2	59	58.8	289.8	22	11.1	1.4	47	30.3	289.4	23	17.9	0.4	34	42.8	289.3	23	14.4	-0.6
20	99	3.9		13	20.7		88	13.1		17	2.7		76	48.1		20	3.9		64	48.6		22	12.5		52	19.7		23	18.3		39	32.1		23	13.8	
40	103	55.1		13	24.0		93	3.8		17	5.6		81	38.4		20	6.0		69	38.4		22	13.9		57	9.2		23	18.7		44	21.4		23	13.3	
18 0	108	46.2	291.2	13	27.3	3.3	97	54.5	290.7	17	8.4	2.8	86	28.6	290.2	20	8.2	2.1	74	28.2	289.8	22	15.2	1.3	61	58.6	289.4	23	19.2	0.4	49	10.6	289.3	23	12.7	-0.6
20	113	37.4		13	30.6		102	45.2		17	11.2		91	18.8		20	10.3		79	17.9		22	16.6		66	48.0		23	19.6		53	59.9		23	12.1	
40	118	28.5		13	33.9		107	35.9		17	14.0		96	9.1		20	12.5		84	7.7		22	17.9		71	37.4		23	20.0		58	49.2		23	11.5	
19 0	123	19.7	291.1	13	37.2	3.3	112	26.6	290.7	17	16.8	2.8	100	59.3	290.2	20	14.6	2.1	88	57.4	289.7	22	19.2	1.3	76	26.9	289.4	23	20.3	0.4	63	38.4	289.3	23	10.8	-0.7
20	128	10.8		13	40.5		117	17.3		17	19.6		105	49.5		20	16.7		93	47.2		22	20.5		81	16.3		23	20.7		68	27.7		23	10.2	
40	133	2.0		13	43.7		122	8.0		17	22.3		110	39.7		20	18.8		98	36.9		22	21.8		86	5.7		23	21.0		73	17.0		23	9.5	
20 0	137	53.1	291.1	13	47.0	3.3	126	58.7	290.7	17	25.1	2.7	115	29.9	290.2	20	20.9	2.1	103	26.7	289.7	22	23.1	1.2	90	55.1	289.4	23	21.4	0.3	78	6.2	289.3	23	8.8	-0.7
20	142	44.3		13	50.3		131	49.4		17	27.9		120	20.0		20	23.0		108	16.4		22	24.3		95	44.5		23	21.7		82	55.5		23	8.1	
40	147	35.4		13	53.5		136	40.1		17	30.6		125	10.2		20	25.1		113	6.2		22	25.6		100	33.9		23	22.0		87	44.8		23	7.4	
21 0	152	26.5	291.1	13	56.8	3.2	141	30.7	290.6	17	33.3	2.7	130	0.4	290.2	20	27.2	2.0	117	55.9	289.7	22	26.8	1.2	105	23.3	289.4	23	22.3	0.3	92	34.0	289.3	23	6.7	-0.7
20	157	17.6		14	0.0		146	21.4		17	36.1		134	50.6		20	29.2		122	45.6		22	28.1		110	12.7		23	22.6		97	23.3		23	6.0	
40	162	8.7		14	3.3		151	12.0		17	38.8		139	40.7		20	31.3		127	35.3		22	29.3		115	2.1		23	22.9		102	12.5		23	5.2	
22 0	166	59.8	291.1	14	6.5	3.2	156	2.7	290.6	17	41.5	2.7	144	30.9	290.1	20	33.3	2.0	132	25.0	289.7	22	30.5	1.2	119	51.5	289.4	23	23.1	0.2	107	1.8	289.3	23	4.5	-0.8
20	171	50.9		14	9.7		160	53.3		17	44.2		149	21.0		20	35.4		137	14.7		22	31.7		124	40.9		23	23.3		111	51.1		23	3.7	
40	176	42.0		14	13.0		165	43.9		17	46.9		154	11.1		20	37.4		142	4.4		22	32.9		129	30.3		23	23.6		116	40.3		23	2.9	
23 0	181	33.1	291.1	14	16.2	3.2	170	34.5	290.6	17	49.6	2.7	159	1.3	290.1	20	39.4	2.0	146	54.1	289.7	22	34.0	1.2	134	19.7	289.4	23	23.8	0.2	121	29.6	289.3	23	2.1	-0.8
20	186	24.2		14	19.4		175	25.2		17	52.3		163	51.4		20	41.4		151	43.8		22	35.2		139	9.1		23	24.0		126	18.8		23	1.3	
40	191	15.2		14	22.6		180	15.8		17	55.0		168	41.5		20	43.4		156	33.5		22	36.3		143	58.4		23	24.2		131	8.1		23	0.5	

2011 Moon

	7 May						8 May						9 May						10 May						11 May						12 May					
	GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec		
h m	°	′	d	°	′	d′	°	′	d	°	′	d′	°	′	d	°	′	d′	°	′	d	°	′	d′	°	′	d	°	′	d′	°	′	d	°	′	d′
0 0	135	57.4	289.3	22	59.6	-0.9	123	5.2	289.3	21	21.6	-1.9	110	22.3	289.5	18	33.8	-2.8	97	54.4	289.7	14	43.8	-3.6	85	40.2	289.9	10	2.7	-4.2	73	33.0	289.9	4	44.1	-4.6
20	140	46.6		22	58.7		127	54.5		21	19.8		115	11.8		18	31.0		102	44.1		14	40.2		90	30.1		9	58.5		78	22.9		4	39.5	
40	145	35.9		22	57.9		132	43.8		21	17.9		120	1.4		18	28.2		107	33.8		14	36.6		95	20.0		9	54.3		83	12.8		4	34.9	
1 0	150	25.1	289.3	22	57.0	-0.9	137	33.1	289.3	21	16.0	-1.9	124	50.9	289.5	18	25.3	-2.8	112	23.6	289.7	14	33.0	-3.6	100	9.9	289.9	9	50.0	-4.2	88	2.7	289.9	4	30.2	-4.6
20	155	14.4		22	56.1		142	22.5		21	14.1		129	40.4		18	22.5		117	13.3		14	29.4		104	59.8		9	45.8		92	52.6		4	25.6	
40	160	3.6		22	55.2		147	11.8		21	12.2		134	29.9		18	19.7		122	3.0		14	25.7		109	49.6		9	41.6		97	42.5		4	21.0	
2 0	164	52.9	289.3	22	54.2	-1.0	152	1.1	289.3	21	10.2	-2.0	139	19.4	289.5	18	16.8	-2.9	126	52.7	289.7	14	22.1	-3.6	114	39.5	289.9	9	37.3	-4.2	102	32.4	289.9	4	16.3	-4.6
20	169	42.1		22	53.3		156	50.5		21	8.3		144	8.9		18	14.0		131	42.5		14	18.5		119	29.4		9	33.1		107	22.3		4	11.7	
40	174	31.4		22	52.3		161	39.8		21	6.3		148	58.5		18	11.1		136	32.2		14	14.8		124	19.3		9	28.8		112	12.2		4	7.1	
3 0	179	20.7	289.3	22	51.3	-1.0	166	29.1	289.3	21	4.3	-2.0	153	48.0	289.5	18	8.2	-2.9	141	22.0	289.7	14	11.2	-3.7	129	9.2	289.9	9	24.6	-4.3	117	2.1	289.9	4	2.4	-4.7
20	184	9.9		22	50.4		171	18.5		21	2.4		158	37.5		18	5.3		146	11.7		14	7.5		133	59.0		9	20.3		121	52.0		3	57.8	
40	188	59.2		22	49.4		176	7.8		21	0.4		163	27.1		18	2.4		151	1.4		14	3.8		138	48.9		9	16.1		126	41.9		3	53.1	
4 0	193	48.4	289.3	22	48.3	-1.0	180	57.2	289.3	20	58.3	-2.0	168	16.6	289.5	17	59.5	-3.0	155	51.2	289.8	14	0.1	-3.7	143	38.8	289.9	9	11.8	-4.3	131	31.8	289.9	3	48.4	-4.6
20	198	37.7		22	47.3		185	46.5		20	56.3		173	6.1		17	56.5		160	40.9		13	56.4		148	28.7		9	7.5		136	21.7		3	43.8	
40	203	26.9		22	46.3		190	35.8		20	54.3		177	55.7		17	53.6		165	30.7		13	52.7		153	18.6		9	3.2		141	11.5		3	39.1	
5 0	208	16.2	289.3	22	45.2	-1.1	195	25.2	289.4	20	52.2	-2.1	182	45.2	289.6	17	50.6	-3.0	170	20.5	289.8	13	49.0	-3.7	158	8.5	289.9	8	58.9	-4.3	146	1.4	289.9	3	34.5	-4.7
20	213	5.5		22	44.1		200	14.5		20	50.1		187	34.8		17	47.7		175	10.2		13	45.3		162	58.4		8	54.6		150	51.3		3	29.8	
40	217	54.7		22	43.0		205	3.9		20	48.1		192	24.3		17	44.7		179	60.0		13	41.5		167	48.3		8	50.3		155	41.2		3	25.1	
6 0	222	44.0	289.3	22	41.9	-1.1	209	53.3	289.4	20	46.0	-2.1	197	13.9	289.6	17	41.7	-3.0	184	49.7	289.8	13	37.8	-3.8	172	38.2	289.9	8	46.0	-4.3	160	31.1	289.9	3	20.4	-4.7
20	227	33.2		22	40.8		214	42.6		20	43.9		202	3.4		17	38.7		189	39.5		13	34.0		177	28.1		8	41.6		165	21.0		3	15.7	
40	232	22.5		22	39.7		219	32.0		20	41.7		206	53.0		17	35.7		194	29.3		13	30.3		182	18.0		8	37.3		170	10.8		3	11.1	
7 0	237	11.7	289.3	22	38.5	-1.2	224	21.3	289.4	20	39.6	-2.2	211	42.6	289.6	17	32.7	-3.1	199	19.0	289.8	13	26.5	-3.8	187	7.9	289.9	8	33.0	-4.4	175	0.7	289.9	3	6.4	-4.7
20	242	1.0		22	37.4		229	10.7		20	37.5		216	32.1		17	29.6		204	8.8		13	22.7		191	57.8		8	28.6		179	50.6		3	1.7	
40	246	50.3		22	36.2		234	0.1		20	35.3		221	21.7		17	26.6		208	58.6		13	18.9		196	47.7		8	24.3		184	40.5		2	57.0	
8 0	251	39.5	289.3	22	35.0	-1.2	238	49.5	289.4	20	33.1	-2.2	226	11.3	289.6	17	23.5	-3.1	213	48.4	289.8	13	15.1	-3.8	201	37.5	289.9	8	19.9	-4.4	189	30.3	289.9	2	52.3	-4.7
20	256	28.8		22	33.8		243	38.8		20	30.9		231	0.9		17	20.4		218	38.2		13	11.3		206	27.4		8	15.5		194	20.2		2	47.6	
40	261	18.0		22	32.6		248	28.2		20	28.7		235	50.4		17	17.4		223	27.9		13	7.5		211	17.3		8	11.2		199	10.1		2	42.9	
9 0	266	7.3	289.3	22	31.4	-1.3	253	17.6	289.4	20	26.5	-2.2	240	40.0	289.6	17	14.3	-3.1	228	17.7	289.8	13	3.7	-3.9	216	7.2	289.9	8	6.8	-4.4	203	59.9	289.9	2	38.2	-4.7
20	270	56.6		22	30.1		258	7.0		20	24.3		245	29.6		17	11.2		233	7.5		12	59.8		220	57.1		8	2.4		208	49.8		2	33.4	
40	275	45.8		22	28.9		262	56.3		20	22.1		250	19.2		17	8.0		237	57.3		12	56.0		225	47.1		7	58.0		213	39.7		2	28.7	
10 0	280	35.1	289.3	22	27.6	-1.3	267	45.7	289.4	20	19.8	-2.3	255	8.8	289.6	17	4.9	-3.1	242	47.1	289.8	12	52.1	-3.9	230	37.0	289.9	7	53.6	-4.4	218	29.5	289.9	2	24.0	-4.7
20	285	24.4		22	26.3		272	35.1		20	17.6		259	58.4		17	1.8		247	36.9		12	48.3		235	26.9		7	49.2		223	19.4		2	19.3	
40	290	13.6		22	25.0		277	24.5		20	15.3		264	48.0		16	58.6		252	26.7		12	44.4		240	16.8		7	44.8		228	9.3		2	14.6	
11 0	295	2.9	289.3	22	23.7	-1.3	282	13.9	289.4	20	13.0	-2.3	269	37.6	289.6	16	55.5	-3.2	257	16.5	289.8	12	40.5	-3.9	245	6.7	289.9	7	40.4	-4.4	232	59.1	289.9	2	9.9	-4.7
20	299	52.1		22	22.4		287	3.3		20	10.7		274	27.2		16	52.3		262	6.3		12	36.6		249	56.6		7	36.0		237	49.0		2	5.1	
40	304	41.4		22	21.0		291	52.7		20	8.4		279	16.8		16	49.1		266	56.1		12	32.7		254	46.5		7	31.6		242	38.8		2	0.4	
12 0	309	30.7	289.3	22	19.7	-1.4	296	42.1	289.4	20	6.0	-2.3	284	6.4	289.6	16	45.9	-3.2	271	45.9	289.8	12	28.8	-3.9	259	36.4	289.9	7	27.1	-4.4	247	28.7	289.8	1	55.7	-4.8
20	314	20.0		22	18.3		301	31.5		20	3.7		288	56.0		16	42.7		276	35.7		12	24.9		264	26.3		7	22.7		252	18.5		1	50.9	
40	319	9.2		22	16.9		306	20.9		20	1.3		293	45.7		16	39.5		281	25.5		12	21.0		269	16.2		7	18.2		257	8.4		1	46.2	
13 0	323	58.5	289.3	22	15.5	-1.4	311	10.3	289.4	19	59.0	-2.4	298	35.3	289.6	16	36.2	-3.2	286	15.3	289.8	12	17.0	-3.9	274	6.1	289.9	7	13.8	-4.5	261	58.2	289.8	1	41.4	-4.7
20	328	47.8		22	14.1		315	59.7		19	56.6		303	24.9		16	33.0		291	5.2		12	13.1		278	56.0		7	9.3		266	48.1		1	36.7	
40	333	37.0		22	12.7		320	49.1		19	54.2		308	14.5		16	29.8		295	55.0		12	9.1		283	45.9		7	4.9		271	37.9		1	32.0	
14 0	338	26.3	289.3	22	11.2	-1.5	325	38.5	289.4	19	51.8	-2.4	313	4.1	289.6	16	26.5	-3.3	300	44.8	289.8	12	5.2	-4.0	288	35.8	289.9	7	0.4	-4.5	276	27.8	289.8	1	27.2	-4.7
20	343	15.6		22	9.8		330	28.0		19	49.4		317	53.8		16	23.2		305	34.6		12	1.2		293	25.7		6	55.9		281	17.6		1	22.5	
40	348	4.9		22	8.3		335	17.4		19	46.9		322	43.4		16	19.9		310	24.4		11	57.2		298	15.6		6	51.5		286	7.4		1	17.7	
15 0	352	54.1	289.3	22	6.8	-1.5	340	6.8	289.4	19	44.5	-2.5	327	33.1	289.6	16	16.6	-3.3	315	14.3	289.8	11	53.2	-4.0	303	5.6	289.9	6	47.0	-4.5	290	57.3	289.8	1	13.0	-4.8
20	357	43.4		22	5.3		344	56.2		19	42.0		332	22.7		16	13.3		320	4.1		11	49.3		307	55.5		6	42.5		295	47.1		1	8.2	
40	2	32.7		22	3.8		349	45.7		19	39.6		337	12.3		16	10.0		324	53.9		11	45.3		312	45.4		6	38.0		300	36.9		1	3.5	
16 0	7	22.0	289.3	22	2.3	-1.5	354	35.1	289.4	19	37.1	-2.5	342	2.0	289.7	16	6.7	-3.3	329	43.8	289.8	11	41.2	-4.0	317	35.3	289.9	6	33.5	-4.5	305	26.7	289.8	0	58.7	-4.8
20	12	11.3		22	0.8		359	24.5		19	34.6		346	51.6		16	3.4		334	33.6		11	37.2		322	25.2		6	29.0		310	16.6		0	53.9	
40	17	0.5		21	59.2		4	14.0		19	32.1		351	41.3		16	0.0		339	23.4		11	33.2		327	15.1		6	24.5		315	6.4		0	49.2	
17 0	21	49.8	289.3	21	57.7	-1.6	9	3.4	289.4	19	29.6	-2.6	356	30.9	289.7	15	56.7	-3.4	344	13.3	289.8	11	29.2	-4.1	332	5.0	289.9	6	20.0	-4.5	319	56.2	289.8	0	44.4	-4.8
20	26	39.1		21	56.1		13	52.9		19	27.0		1	20.6		15	53.3		349	3.1		11	25.1		336	54.9		6	15.5		324	46.0		0	39.6	
40	31	28.4		21	54.5		18	42.3		19	24.5		6	10.3		15	49.9		353	52.9		11	21.1		341	44.8		6	11.0		329	35.8		0	34.9	
18 0	36	17.7	289.3	21	52.9	-1.6	23	31.8	289.5	19	21.9	-2.6	10	59.9	289.7	15	46.5	-3.4	358	42.8	289.8	11	17.0	-4.1	346	34.7	289.9	6	6.4	-4.5	334	25.7	289.8	0	30.1	-4.8
20	41	7.0		21	51.3		28	21.2		19	19.3		15	49.6		15	43.1		3	32.6		11	13.0		351	24.6		6	1.9		339	15.5		0	25.3	
40	45	56.3		21	49.6		33	10.7		19	16.8		20	39.3		15	39.7		8	22.5		11	8.9		356	14.5		5	57.4		344	5.3		0	20.6	
19 0	50	45.6	289.3	21	48.0	-1.7	38	0.1	289.5	19	14.2	-2.6	25	28.9	289.7	15	36.3	-3.4	13	12.3	289.9	11	4.8	-4.1	1	4.5	289.9	5	52.8	-4.6	348	55.1	289.8	0	15.8	-4.8
20	55	34.9		21	46.3		42	49.6		19	11.6		30	18.6		15	32.9		18	2.2		11	0.7		5	54.4		5	48.3		353	44.9		0	11.0	
40	60	24.2		21	44.6		47	39.0		19	8.9		35	8.3		15	29.4		22	52.0		10	56.6		10	44.3		5	43.7		358	34.7		0	6.2	
20 0	65	13.5	289.3	21	43.0	-1.7	52	28.5	289.5	19	6.3	-2.7	39	58.0	289.7	15	26.0	-3.5	27	41.9	289.9	10	52.5	-4.1	15	34.2	289.9	5	39.1	-4.6	3	24.5	289.8	0	1.5	-4.8
20	70	2.8		21	41.3		57	18.0		19	3.7		44	47.7		15	22.5		32	31.7		10	48.4		20	24.1		5	34.6		8	14.3		-0	3.3	
40	74	52.1		21	39.5		62	7.5		19	1.0		49	37.4		15	19.0		37	21.6		10	44.3		25	14.0		5	30.0		13	4.0		-0	8.1	
21 0	79	41.4	289.3	21	37.8	-1.8	66	56.9	289.5	18	58.3	-2.7	54	27.0	289.7	15	15.6	-3.5	42	11.4	289.9	10	40.2	-4.2	30	3.9	289.9	5	25.4	-4.6	17	53.8	289.8	-0	12.9	-4.8
20	84	30.7		21	36.1		71	46.4		18	55.7		59	16.7		15	12.1		47	1.3		10	36.0		34	53.8		5	20.9		22	43.6		-0	17.7	
40	89	20.0		21	34.3		76	35.9		18	53.0		64	6.4		15	8.6		51	51.2		10	31.9		39	43.7		5	16.3		27	33.4		-0	22.4	
22 0	94	9.3	289.3	21	32.5	-1.8	81	25.4	289.5	18	50.3	-2.7	68	56.1	289.7	15	5.0	-3.5	56	41.0	289.9	10	27.7	-4.2	44	33.6	289.9	5	11.7	-4.6	32	23.2	289.8	-0	27.2	-4.8
20	98	58.6		21	30.8		86	14.9		18	47.5		73	45.8		15	1.5		61	30.9		10	23.6		49	23.5		5	7.1		37	12.9		-0	32.0	
40	103	47.9		21	29.0		91	4.4		18	44.8		78	35.5		14	58.0		66	20.8		10	19.4		54	13.4		5	2.5		42	2.7		-0	36.8	
23 0	108	37.2	289.3	21	27.1	-1.8	95	53.8	289.5	18	42.1	-2.8	83	25.2	289.7	14	54.4	-3.5	71	10.6	289.9	10	15.2	-4.2	59	3.3	289.9	4	57.9	-4.6	46	52.5	289.8	-0	41.6	-4.8
20	113	26.5		21	25.3		100	43.3		18	39.3		88	15.0		14	50.9		76	0.5		10	11.0		63	53.2		4	53.3		51	42.3		-0	46.4	
40	118	15.9		21	23.5		105	32.8		18	36.5		93	4.7		14	47.3		80	50.4		10	6.9		68	43.1		4	48.7		56	32.0		-0	51.2	

2011 Moon

	13 May						14 May						15 May						16 May						17 May						18 May					
	GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec		
h m	°	'	d	°	'	d '	°	'	d	°	'	d '	°	'	d	°	'	d '	°	'	d	°	'	d '	°	'	d	°	'	d '	°	'	d	°	'	d '
0 0	61	21.8	289.8	-0	56.0	-4.8	48	53.7	289.4	-6	38.9	-4.7	35	56.7	289.0	-12	3.3	-4.3	22	23.3	288.4	-16	46.1	-3.5	8	14.0	288.0	-20	24.4	-2.5	353	41.4	287.8	-22	40.0	-1.2
20	66	11.5		-1	0.7		53	43.1		-6	43.6		40	45.7		-12	7.6		27	11.7		-16	49.6		13	2.0		-20	26.8		358	29.2		-22	41.3	
40	71	1.3		-1	5.5		58	32.5		-6	48.2		45	34.7		-12	11.9		32	0.1		-16	53.1		17	50.0		-20	29.3		3	17.0		-22	42.5	
1 0	75	51.0	289.7	-1	10.3	-4.8	63	22.0	289.4	-6	52.9	-4.7	50	23.6	288.9	-12	16.1	-4.2	36	48.6	288.4	-16	56.6	-3.5	22	38.0	288.0	-20	31.8	-2.4	8	4.9	287.8	-22	43.7	-1.2
20	80	40.8		-1	15.1		68	11.4		-6	57.6		55	12.5		-12	20.4		41	37.0		-17	0.1		27	26.0		-20	34.2		12	52.7		-22	44.9	
40	85	30.5		-1	19.9		73	0.8		-7	2.3		60	1.5		-12	24.6		46	25.4		-17	3.6		32	14.0		-20	36.6		17	40.5		-22	46.1	
2 0	90	20.3	289.7	-1	24.7	-4.8	77	50.2	289.4	-7	6.9	-4.7	64	50.4	288.9	-12	28.8	-4.2	51	13.8	288.4	-17	7.0	-3.4	37	2.0	288.0	-20	39.0	-2.4	22	28.3	287.8	-22	47.3	-1.1
20	95	10.0		-1	29.5		82	39.6		-7	11.6		69	39.3		-12	33.0		56	2.2		-17	10.5		41	49.9		-20	41.4		27	16.1		-22	48.4	
40	99	59.7		-1	34.3		87	29.0		-7	16.3		74	28.2		-12	37.2		60	50.6		-17	13.9		46	37.9		-20	43.8		32	3.9		-22	49.5	
3 0	104	49.4	289.7	-1	39.1	-4.8	92	18.4	289.4	-7	20.9	-4.7	79	17.1	288.9	-12	41.4	-4.2	65	38.9	288.4	-17	17.3	-3.4	51	25.9	288.0	-20	46.1	-2.3	36	51.7	287.8	-22	50.6	-1.1
20	109	39.2		-1	43.9		97	7.7		-7	25.6		84	6.0		-12	45.6		70	27.3		-17	20.7		56	13.8		-20	48.5		41	39.6		-22	51.7	
40	114	28.9		-1	48.7		101	57.1		-7	30.2		88	54.9		-12	49.8		75	15.7		-17	24.1		61	1.8		-20	50.8		46	27.4		-22	52.8	
4 0	119	18.6	289.7	-1	53.5	-4.8	106	46.5	289.4	-7	34.9	-4.6	93	43.8	288.9	-12	54.0	-4.2	80	4.0	288.3	-17	27.5	-3.4	65	49.7	287.9	-20	53.1	-2.3	51	15.2	287.8	-22	53.8	-1.0
20	124	8.3		-1	58.2		111	35.8		-7	39.5		98	32.7		-12	58.2		84	52.4		-17	30.9		70	37.7		-20	55.4		56	3.0		-22	54.9	
40	128	58.0		-2	3.0		116	25.2		-7	44.1		103	21.5		-13	2.3		89	40.7		-17	34.2		75	25.6		-20	57.6		60	50.8		-22	55.9	
5 0	133	47.7	289.7	-2	7.8	-4.8	121	14.5	289.3	-7	48.8	-4.6	108	10.4	288.8	-13	6.5	-4.1	94	29.1	288.3	-17	37.6	-3.3	80	13.5	287.9	-20	59.9	-2.2	65	38.6	287.8	-22	56.9	-0.9
20	138	37.4		-2	12.6		126	3.9		-7	53.4		112	59.3		-13	10.6		99	17.4		-17	40.9		85	1.5		-21	2.1		70	26.5		-22	57.8	
40	143	27.1		-2	17.4		130	53.2		-7	58.0		117	48.1		-13	14.7		104	5.7		-17	44.2		89	49.4		-21	4.4		75	14.3		-22	58.8	
6 0	148	16.8	289.7	-2	22.2	-4.8	135	42.6	289.3	-8	2.6	-4.6	122	36.9	288.8	-13	18.9	-4.1	108	54.0	288.3	-17	47.5	-3.3	94	37.3	287.9	-21	6.6	-2.2	80	2.1	287.8	-22	59.7	-0.9
20	153	6.5		-2	27.0		140	31.9		-8	7.2		127	25.8		-13	23.0		113	42.3		-17	50.8		99	25.3		-21	8.7		84	49.9		-23	0.7	
40	157	56.2		-2	31.8		145	21.2		-8	11.8		132	14.6		-13	27.1		118	30.7		-17	54.1		104	13.2		-21	10.9		89	37.7		-23	1.6	
7 0	162	45.9	289.7	-2	36.6	-4.8	150	10.5	289.3	-8	16.4	-4.6	137	3.4	288.8	-13	31.2	-4.1	123	19.0	288.3	-17	57.3	-3.2	109	1.1	287.9	-21	13.1	-2.1	94	25.6	287.8	-23	2.5	-0.8
20	167	35.6		-2	41.4		154	59.8		-8	21.0		141	52.2		-13	35.2		128	7.2		-18	0.6		113	49.0		-21	15.2		99	13.4		-23	3.3	
40	172	25.2		-2	46.2		159	49.1		-8	25.6		146	41.0		-13	39.3		132	55.5		-18	3.8		118	36.9		-21	17.3		104	1.2		-23	4.2	
8 0	177	14.9	289.7	-2	50.9	-4.8	164	38.4	289.3	-8	30.2	-4.6	151	29.8	288.8	-13	43.4	-4.0	137	43.8	288.3	-18	7.0	-3.2	123	24.8	287.9	-21	19.4	-2.1	108	49.1	287.8	-23	5.0	-0.8
20	182	4.6		-2	55.7		169	27.7		-8	34.8		156	18.6		-13	47.4		142	32.1		-18	10.2		128	12.7		-21	21.5		113	36.9		-23	5.8	
40	186	54.2		-3	0.5		174	17.0		-8	39.4		161	7.4		-13	51.5		147	20.3		-18	13.4		133	0.6		-21	23.6		118	24.7		-23	6.6	
9 0	191	43.9	289.7	-3	5.3	-4.8	179	6.3	289.3	-8	43.9	-4.6	165	56.2	288.8	-13	55.5	-4.0	152	8.6	288.2	-18	16.6	-3.2	137	48.5	287.9	-21	25.6	-2.0	123	12.5	287.8	-23	7.4	-0.7
20	196	33.6		-3	10.1		183	55.5		-8	48.5		170	44.9		-13	59.5		156	56.8		-18	19.8		142	36.4		-21	27.7		128	0.4		-23	8.2	
40	201	23.2		-3	14.9		188	44.8		-8	53.1		175	33.7		-14	3.6		161	45.1		-18	22.9		147	24.3		-21	29.7		132	48.2		-23	8.9	
10 0	206	12.9	289.6	-3	19.7	-4.8	193	34.0	289.2	-8	57.6	-4.6	180	22.4	288.7	-14	7.6	-4.0	166	33.3	288.2	-18	26.1	-3.1	152	12.2	287.9	-21	31.7	-2.0	137	36.1	287.8	-23	9.6	-0.7
20	211	2.5		-3	24.4		198	23.3		-9	2.2		185	11.2		-14	11.6		171	21.6		-18	29.2		157	0.1		-21	33.7		142	23.9		-23	10.3	
40	215	52.1		-3	29.2		203	12.5		-9	6.7		189	59.9		-14	15.6		176	9.8		-18	32.3		161	47.9		-21	35.7		147	11.7		-23	11.0	
11 0	220	41.8	289.6	-3	34.0	-4.8	208	1.8	289.2	-9	11.3	-4.5	194	48.6	288.7	-14	19.5	-4.0	180	58.0	288.2	-18	35.4	-3.1	166	35.8	287.9	-21	37.6	-1.9	151	59.6	287.8	-23	11.7	-0.6
20	225	31.4		-3	38.8		212	51.0		-9	15.8		199	37.4		-14	23.5		185	46.2		-18	38.5		171	23.7		-21	39.5		156	47.4		-23	12.4	
40	230	21.0		-3	43.6		217	40.2		-9	20.3		204	26.1		-14	27.4		190	34.4		-18	41.5		176	11.6		-21	41.4		161	35.3		-23	13.0	
12 0	235	10.6	289.6	-3	48.3	-4.8	222	29.4	289.2	-9	24.8	-4.5	209	14.8	288.7	-14	31.4	-3.9	195	22.6	288.2	-18	44.6	-3.0	180	59.4	287.9	-21	43.3	-1.9	166	23.1	287.9	-23	13.6	-0.6
20	240	0.3		-3	53.1		227	18.7		-9	29.4		214	3.5		-14	35.3		200	10.8		-18	47.6		185	47.3		-21	45.2		171	11.0		-23	14.2	
40	244	49.9		-3	57.9		232	7.9		-9	33.9		218	52.2		-14	39.3		204	59.0		-18	50.6		190	35.1		-21	47.1		175	58.9		-23	14.8	
13 0	249	39.5	289.6	-4	2.6	-4.8	236	57.1	289.2	-9	38.4	-4.5	223	40.8	288.7	-14	43.2	-3.9	209	47.2	288.2	-18	53.6	-3.0	195	23.0	287.9	-21	48.9	-1.8	180	46.7	287.9	-23	15.4	-0.5
20	254	29.1		-4	7.4		241	46.3		-9	42.9		228	29.5		-14	47.1		214	35.4		-18	56.6		200	10.9		-21	50.8		185	34.6		-23	15.9	
40	259	18.7		-4	12.2		246	35.4		-9	47.4		233	18.2		-14	51.0		219	23.5		-18	59.6		204	58.7		-21	52.6		190	22.4		-23	16.4	
14 0	264	8.3	289.6	-4	17.0	-4.7	251	24.6	289.2	-9	51.9	-4.5	238	6.8	288.6	-14	54.8	-3.9	224	11.7	288.2	-19	2.6	-2.9	209	46.6	287.8	-21	54.4	-1.8	195	10.3	287.9	-23	16.9	-0.5
20	268	57.8		-4	21.7		256	13.8		-9	56.3		242	55.5		-14	58.7		228	59.9		-19	5.5		214	34.4		-21	56.2		199	58.2		-23	17.4	
40	273	47.4		-4	26.5		261	2.9		-10	0.8		247	44.1		-15	2.6		233	48.0		-19	8.4		219	22.3		-21	57.9		204	46.1		-23	17.9	
15 0	278	37.0	289.6	-4	31.2	-4.8	265	52.1	289.1	-10	5.3	-4.5	252	32.8	288.6	-15	6.4	-3.8	238	36.2	288.1	-19	11.4	-2.9	224	10.1	287.8	-21	59.7	-1.7	209	33.9	287.9	-23	18.4	-0.4
20	283	26.6		-4	36.0		270	41.3		-10	9.7		257	21.4		-15	10.3		243	24.3		-19	14.3		228	58.0		-22	1.4		214	21.8		-23	18.8	
40	288	16.1		-4	40.8		275	30.4		-10	14.2		262	10.0		-15	14.1		248	12.4		-19	17.1		233	45.8		-22	3.1		219	9.7		-23	19.2	
16 0	293	5.7	289.6	-4	45.5	-4.8	280	19.5	289.1	-10	18.7	-4.4	266	58.7	288.6	-15	17.9	-3.8	253	0.6	288.1	-19	20.0	-2.8	238	33.6	287.8	-22	4.8	-1.6	223	57.6	287.9	-23	19.6	-0.4
20	297	55.3		-4	50.3		285	8.7		-10	23.1		271	47.3		-15	21.7		257	48.7		-19	22.9		243	21.5		-22	6.5		228	45.5		-23	20.0	
40	302	44.8		-4	55.0		289	57.8		-10	27.5		276	35.9		-15	25.5		262	36.8		-19	25.7		248	9.3		-22	8.1		233	33.4		-23	20.4	
17 0	307	34.4	289.5	-4	59.8	-4.7	294	46.9	289.1	-10	32.0	-4.4	281	24.5	288.6	-15	29.3	-3.8	267	24.9	288.1	-19	28.5	-2.8	252	57.2	287.8	-22	9.7	-1.6	238	21.3	287.9	-23	20.7	-0.3
20	312	23.9		-5	4.5		299	36.0		-10	36.4		286	13.0		-15	33.1		272	13.0		-19	31.4		257	45.0		-22	11.4		243	9.2		-23	21.1	
40	317	13.4		-5	9.3		304	25.1		-10	40.8		291	1.6		-15	36.8		277	1.1		-19	34.2		262	32.8		-22	13.0		247	57.1		-23	21.4	
18 0	322	3.0	289.5	-5	14.0	-4.7	309	14.2	289.1	-10	45.2	-4.4	295	50.2	288.6	-15	40.6	-3.7	281	49.2	288.1	-19	36.9	-2.8	267	20.7	287.8	-22	14.6	-1.5	252	45.0	287.9	-23	21.7	-0.3
20	326	52.5		-5	18.7		314	3.3		-10	49.6		300	38.8		-15	44.3		286	37.3		-19	39.7		272	8.5		-22	16.1		257	32.9		-23	22.0	
40	331	42.0		-5	23.5		318	52.4		-10	54.0		305	27.3		-15	48.1		291	25.4		-19	42.5		276	56.3		-22	17.7		262	20.8		-23	22.2	
19 0	336	31.6	289.5	-5	28.2	-4.7	323	41.5	289.1	-10	58.4	-4.4	310	15.9	288.5	-15	51.8	-3.7	296	13.5	288.1	-19	45.2	-2.7	281	44.1	287.8	-22	19.2	-1.5	267	8.7	287.9	-23	22.5	-0.2
20	341	21.1		-5	32.9		328	30.5		-11	2.8		315	4.4		-15	55.5		301	1.6		-19	47.9		286	32.0		-22	20.7		271	56.6		-23	22.7	
40	346	10.6		-5	37.7		333	19.6		-11	7.2		319	53.0		-15	59.2		305	49.6		-19	50.6		291	19.8		-22	22.2		276	44.6		-23	22.9	
20 0	351	0.1	289.5	-5	42.4	-4.7	338	8.6	289.0	-11	11.5	-4.4	324	41.5	288.5	-16	2.8	-3.7	310	37.7	288.1	-19	53.3	-2.7	296	7.6	287.8	-22	23.7	-1.4	281	32.5	287.9	-23	23.1	-0.1
20	355	49.6		-5	47.1		342	57.7		-11	15.9		329	30.0		-16	6.5		315	25.7		-19	56.0		300	55.4		-22	25.1		286	20.4		-23	23.3	
40	0	39.1		-5	51.8		347	46.7		-11	20.2		334	18.5		-16	10.2		320	13.8		-19	58.6		305	43.2		-22	26.6		291	8.4		-23	23.4	
21 0	5	28.5	289.5	-5	56.6	-4.7	352	35.8	289.0	-11	24.6	-4.3	339	7.0	288.5	-16	13.8	-3.6	325	1.8	288.0	-20	1.3	-2.6	310	31.1	287.8	-22	28.0	-1.4	295	56.3	288.0	-23	23.5	-0.1
20	10	18.0		-6	1.3		357	24.8		-11	28.9		343	55.5		-16	17.4		329	49.9		-20	3.9		315	18.9		-22	29.4		300	44.3		-23	23.7	
40	15	7.5		-6	6.0		2	13.8		-11	33.2		348	44.0		-16	21.1		334	37.9		-20	6.5		320	6.7		-22	30.8		305	32.2		-23	23.8	
22 0	19	57.0	289.5	-6	10.7	-4.7	7	2.8	289.0	-11	37.6	-4.3	353	32.5	288.5	-16	24.7	-3.6	339	26.0	288.0	-20	9.1	-2.6	324	54.5	287.8	-22	32.2	-1.3	310	20.2	288.0	-23	23.8	-0.1
20	24	46.4		-6	15.4		11	51.8		-11	41.9		358	21.0		-16	28.3		344	14.0		-20	11.7		329	42.3		-22	33.5		315	8.1		-23	23.9	
40	29	35.9		-6	20.1		16	40.8		-11	46.2		3	9.5		-16	31.9		349	2.0		-20	14.3		334	30.1		-22	34.9		319	56.1		-23	24.0	
23 0	34	25.4	289.4	-6	24.8	-4.7	21	29.8	289.0	-11	50.5	-4.3	7	57.9	288.4	-16	35.4	-3.6	353	50.0	288.0	-20	16.8	-2.5	339	18.0	287.8	-22	36.2	-1.3	324	44.1	288.0	-23	24.0	0.0
20	39	14.8		-6	29.5		26	18.8		-11	54.8		12	46.4		-16	39.0		358	38.0		-20	19.3		344	5.8		-22	37.5		329	32.0		-23	24.0	
40	44	4.2		-6	34.2		31	7.8		-11	59.1		17	34.8		-16	42.5		3	26.0		-20	21.9		348	53.6		-22	38.8		334	20.0		-23	24.0	

2011 Moon

h m	19 May GHA ° ′	d	Dec ° ′	d′	20 May GHA ° ′	d	Dec ° ′	d′	21 May GHA ° ′	d	Dec ° ′	d′	22 May GHA ° ′	d	Dec ° ′	d′	23 May GHA ° ′	d	Dec ° ′	d′	24 May GHA ° ′	d	Dec ° ′	d′
0 0	339 8.0	288.0	-23 24.0	0.1	324 59.8	288.5	-22 38.2	1.3	311 37.1	289.2	-20 34.1	2.2	299 9.2	290.0	-17 28.3	2.9	287 34.6	290.7	-13 38.2	3.5	276 44.6	291.2	-9 18.8	3.7
20	343 56.0		-23 23.9		329 48.3		-22 36.9		316 26.3		-20 31.9		303 59.2		-17 25.4		292 25.3		-13 34.7		281 35.8		-9 15.1	
40	348 44.0		-23 23.9		334 36.8		-22 35.7		321 15.6		-20 29.7		308 49.2		-17 22.4		297 16.0		-13 31.3		286 27.1		-9 11.3	
1 0	353 32.0	288.0	-23 23.8	0.1	339 25.3	288.5	-22 34.4	1.3	326 4.8	289.3	-20 27.4	2.2	313 39.2	290.0	-17 19.5	3.0	302 6.7	290.7	-13 27.8	3.4	291 18.3	291.3	-9 7.6	3.8
20	358 20.0		-23 23.7		344 13.9		-22 33.2		330 54.1		-20 25.2		318 29.2		-17 16.5		306 57.4		-13 24.4		296 9.5		-9 3.8	
40	3 8.0		-23 23.6		349 2.4		-22 31.9		335 43.3		-20 23.0		323 19.3		-17 13.6		311 48.1		-13 20.9		301 0.8		-9 0.1	
2 0	7 56.0	288.0	-23 23.5	0.2	353 51.0	288.6	-22 30.6	1.3	340 32.6	289.3	-20 20.7	2.3	328 9.3	290.1	-17 10.6	3.0	316 38.8	290.8	-13 17.5	3.5	305 52.1	291.3	-8 56.3	3.8
20	12 44.0		-23 23.3		358 39.5		-22 29.3		345 21.9		-20 18.4		332 59.4		-17 7.6		321 29.6		-13 14.0		310 43.3		-8 52.6	
40	17 32.1		-23 23.2		3 28.1		-22 28.0		350 11.2		-20 16.2		337 49.5		-17 4.6		326 20.3		-13 10.5		315 34.6		-8 48.8	
3 0	22 20.1	288.0	-23 23.0	0.2	8 16.7	288.6	-22 26.6	1.4	355 0.5	289.3	-20 13.9	2.3	342 39.5	290.1	-17 1.6	3.0	331 11.1	290.8	-13 7.1	3.5	320 25.9	291.3	-8 45.0	3.8
20	27 8.1		-23 22.8		13 5.2		-22 25.3		359 49.9		-20 11.6		347 29.6		-16 58.6		336 1.9		-13 3.6		325 17.2		-8 41.2	
40	31 56.2		-23 22.6		17 53.8		-22 23.9		4 39.2		-20 9.2		352 19.7		-16 55.6		340 52.6		-13 0.1		330 8.5		-8 37.5	
4 0	36 44.2	288.1	-23 22.4	0.3	22 42.4	288.6	-22 22.5	1.4	9 28.5	289.4	-20 6.9	2.3	357 9.9	290.1	-16 52.6	3.0	345 43.4	290.8	-12 56.6	3.5	334 59.8	291.3	-8 33.7	3.8
20	41 32.3		-23 22.1		27 31.1		-22 21.1		14 17.9		-20 4.6		1 60.0		-16 49.6		350 34.2		-12 53.1		339 51.1		-8 29.9	
40	46 20.3		-23 21.9		32 19.7		-22 19.7		19 7.3		-20 2.2		6 50.1		-16 46.5		355 25.0		-12 49.6		344 42.4		-8 26.1	
5 0	51 8.4	288.1	-23 21.6	0.3	37 8.3	288.7	-22 18.3	1.5	23 56.7	289.4	-19 59.9	2.4	11 40.3	290.2	-16 43.5	3.1	0 15.8	290.8	-12 46.1	3.5	349 33.7	291.3	-8 22.3	3.8
20	55 56.5		-23 21.3		41 57.0		-22 16.8		28 46.0		-19 57.5		16 30.4		-16 40.4		5 6.7		-12 42.6		354 25.0		-8 18.6	
40	60 44.5		-23 21.0		46 45.6		-22 15.4		33 35.4		-19 55.1		21 20.6		-16 37.4		9 57.5		-12 39.1		359 16.3		-8 14.8	
6 0	65 32.6	288.1	-23 20.6	0.4	51 34.3	288.7	-22 13.9	1.5	38 24.9	289.4	-19 52.7	2.4	26 10.8	290.2	-16 34.3	3.1	14 48.3	290.9	-12 35.5	3.5	4 7.7	291.3	-8 11.0	3.8
20	70 20.7		-23 20.3		56 23.0		-22 12.4		43 14.3		-19 50.3		31 0.9		-16 31.2		19 39.2		-12 32.0		8 59.0		-8 7.2	
40	75 8.8		-23 19.9		61 11.6		-22 10.9		48 3.7		-19 47.9		35 51.1		-16 28.1		24 30.0		-12 28.5		13 50.3		-8 3.4	
7 0	79 56.9	288.1	-23 19.5	0.4	66 0.3	288.7	-22 9.4	1.6	52 53.2	289.5	-19 45.5	2.5	40 41.3	290.2	-16 25.0	3.1	29 20.9	290.9	-12 24.9	3.5	18 41.7	291.4	-7 59.6	3.8
20	84 45.0		-23 19.1		70 49.0		-22 7.8		57 42.6		-19 43.0		45 31.6		-16 21.9		34 11.7		-12 21.4		23 33.0		-7 55.8	
40	89 33.1		-23 18.7		75 37.7		-22 6.3		62 32.1		-19 40.6		50 21.8		-16 18.8		39 2.6		-12 17.8		28 24.4		-7 52.0	
8 0	94 21.3	288.1	-23 18.3	0.5	80 26.5	288.7	-22 4.7	1.6	67 21.6	289.5	-19 38.1	2.5	55 12.0	290.3	-16 15.7	3.1	43 53.5	290.9	-12 14.3	3.6	33 15.8	291.4	-7 48.1	3.8
20	99 9.4		-23 17.8		85 15.2		-22 3.2		72 11.1		-19 35.7		60 2.3		-16 12.6		48 44.4		-12 10.7		38 7.1		-7 44.3	
40	103 57.5		-23 17.4		90 3.9		-22 1.6		77 0.6		-19 33.2		64 52.5		-16 9.5		53 35.3		-12 7.2		42 58.5		-7 40.5	
9 0	108 45.7	288.2	-23 16.9	0.5	94 52.7	288.8	-22 0.0	1.6	81 50.1	289.5	-19 30.7	2.5	69 42.8	290.3	-16 6.3	3.1	58 26.2	290.9	-12 3.6	3.6	47 49.9	291.4	-7 36.7	3.8
20	113 33.8		-23 16.4		99 41.4		-21 58.4		86 39.6		-19 28.2		74 33.1		-16 3.2		63 17.1		-12 0.0		52 41.3		-7 32.9	
40	118 22.0		-23 15.8		104 30.2		-21 56.7		91 29.1		-19 25.7		79 23.3		-16 0.0		68 8.0		-11 56.5		57 32.7		-7 29.1	
10 0	123 10.1	288.2	-23 15.3	0.6	109 19.0	288.8	-21 55.1	1.7	96 18.7	289.6	-19 23.2	2.6	84 13.6	290.3	-15 56.9	3.2	72 59.0	290.9	-11 52.9	3.6	62 24.1	291.4	-7 25.2	3.8
20	127 58.3		-23 14.8		114 7.8		-21 53.4		101 8.2		-19 20.6		89 3.9		-15 53.7		77 49.9		-11 49.3		67 15.5		-7 21.4	
40	132 46.5		-23 14.2		118 56.6		-21 51.7		105 57.8		-19 18.1		93 54.3		-15 50.5		82 40.9		-11 45.7		72 6.9		-7 17.6	
11 0	137 34.7	288.2	-23 13.6	0.6	123 45.4	288.8	-21 50.1	1.7	110 47.4	289.6	-19 15.5	2.6	98 44.6	290.3	-15 47.4	3.2	87 31.8	291.0	-11 42.1	3.6	76 58.3	291.4	-7 13.7	3.8
20	142 22.8		-23 13.0		128 34.2		-21 48.4		115 36.9		-19 13.0		103 34.9		-15 44.2		92 22.8		-11 38.5		81 49.7		-7 9.9	
40	147 11.0		-23 12.4		133 23.0		-21 46.7		120 26.5		-19 10.4		108 25.3		-15 41.0		97 13.7		-11 34.9		86 41.1		-7 6.1	
12 0	151 59.2	288.2	-23 11.8	0.7	138 11.9	288.9	-21 44.9	1.7	125 16.1	289.6	-19 7.8	2.6	113 15.6	290.4	-15 37.8	3.2	102 4.7	291.0	-11 31.3	3.6	91 32.5	291.4	-7 2.2	3.8
20	156 47.5		-23 11.1		143 0.7		-21 43.2		130 5.8		-19 5.2		118 6.0		-15 34.6		106 55.7		-11 27.7		96 24.0		-6 58.4	
40	161 35.7		-23 10.4		147 49.6		-21 41.4		134 55.4		-19 2.6		122 56.3		-15 31.3		111 46.7		-11 24.1		101 15.4		-6 54.6	
13 0	166 23.9	288.2	-23 9.7	0.7	152 38.5	288.9	-21 39.7	1.8	139 45.0	289.7	-19 0.0	2.6	127 46.7	290.4	-15 28.1	3.2	116 37.7	291.0	-11 20.5	3.6	106 6.9	291.5	-6 50.7	3.8
20	171 12.1		-23 9.0		157 27.4		-21 37.9		144 34.7		-18 57.4		132 37.1		-15 24.9		121 28.7		-11 16.8		110 58.3		-6 46.9	
40	176 0.4		-23 8.3		162 16.2		-21 36.1		149 24.3		-18 54.7		137 27.5		-15 21.7		126 19.7		-11 13.2		115 49.7		-6 43.0	
14 0	180 48.6	288.3	-23 7.6	0.8	167 5.1	288.9	-21 34.3	1.8	154 14.0	289.7	-18 52.1	2.7	142 17.9	290.4	-15 18.4	3.3	131 10.7	291.0	-11 9.6	3.7	120 41.2	291.5	-6 39.2	3.9
20	185 36.9		-23 6.8		171 54.1		-21 32.5		159 3.7		-18 49.4		147 8.4		-15 15.2		136 1.8		-11 5.9		125 32.7		-6 35.3	
40	190 25.1		-23 6.1		176 43.0		-21 30.6		163 53.4		-18 46.8		151 58.8		-15 11.9		140 52.8		-11 2.3		130 24.1		-6 31.5	
15 0	195 13.4	288.3	-23 5.3	0.8	181 31.9	289.0	-21 28.8	1.9	168 43.1	289.7	-18 44.1	2.7	156 49.2	290.5	-15 8.6	3.3	145 43.8	291.1	-10 58.6	3.6	135 15.6	291.5	-6 27.6	3.9
20	200 1.7		-23 4.5		186 20.9		-21 26.9		173 32.8		-18 41.4		161 39.7		-15 5.4		150 34.9		-10 55.0		140 7.1		-6 23.7	
40	204 50.0		-23 3.7		191 9.8		-21 25.0		178 22.5		-18 38.7		166 30.1		-15 2.1		155 25.9		-10 51.3		144 58.5		-6 19.9	
16 0	209 38.3	288.3	-23 2.9	0.9	195 58.8	289.0	-21 23.2	1.9	183 12.3	289.8	-18 36.0	2.7	171 20.6	290.5	-14 58.8	3.3	160 17.0	291.1	-10 47.7	3.7	149 50.0	291.5	-6 16.0	3.9
20	214 26.6		-23 2.0		200 47.8		-21 21.3		188 2.0		-18 33.3		176 11.1		-14 55.5		165 8.1		-10 44.0		154 41.5		-6 12.2	
40	219 14.9		-23 1.1		205 36.7		-21 19.3		192 51.8		-18 30.6		181 1.6		-14 52.2		169 59.2		-10 40.4		159 33.0		-6 8.3	
17 0	224 3.2	288.3	-23 0.3	0.9	210 25.7	289.0	-21 17.4	1.9	197 41.6	289.8	-18 27.8	2.7	185 52.1	290.5	-14 48.9	3.3	174 50.2	291.1	-10 36.7	3.7	164 24.5	291.5	-6 4.4	3.9
20	228 51.5		-22 59.4		215 14.7		-21 15.5		202 31.3		-18 25.1		190 42.6		-14 45.6		179 41.3		-10 33.0		169 16.0		-6 0.6	
40	233 39.9		-22 58.5		220 3.8		-21 13.5		207 21.1		-18 22.3		195 33.1		-14 42.3		184 32.4		-10 29.4		174 7.5		-5 56.7	
18 0	238 28.2	288.4	-22 57.5	0.9	224 52.8	289.0	-21 11.6	2.0	212 10.9	289.8	-18 19.6	2.8	200 23.6	290.5	-14 39.0	3.3	189 23.5	291.1	-10 25.7	3.7	178 59.0	291.5	-5 52.8	3.9
20	243 16.5		-22 56.6		229 41.8		-21 9.6		217 0.7		-18 16.8		205 14.1		-14 35.7		194 14.6		-10 22.0		183 50.5		-5 48.9	
40	248 4.9		-22 55.6		234 30.9		-21 7.6		221 50.6		-18 14.0		210 4.7		-14 32.3		199 5.8		-10 18.3		188 42.1		-5 45.1	
19 0	252 53.3	288.4	-22 54.7	1.0	239 19.9	289.1	-21 5.6	2.0	226 40.4	289.9	-18 11.2	2.8	214 55.2	290.6	-14 29.0	3.4	203 56.9	291.1	-10 14.6	3.7	193 33.6	291.5	-5 41.2	3.9
20	257 41.6		-22 53.7		244 9.0		-21 3.6		231 30.2		-18 8.4		219 45.8		-14 25.6		208 48.0		-10 10.9		198 25.1		-5 37.3	
40	262 30.0		-22 52.7		248 58.1		-21 1.6		236 20.1		-18 5.6		224 36.3		-14 22.3		213 39.2		-10 7.2		203 16.6		-5 33.4	
20 0	267 18.4	288.4	-22 51.6	1.0	253 47.2	289.1	-20 59.5	2.1	241 10.0	289.9	-18 2.8	2.8	229 26.9	290.6	-14 18.9	3.4	218 30.3	291.2	-10 3.5	3.7	208 8.2	291.5	-5 29.5	3.9
20	272 6.8		-22 50.6		258 36.3		-20 57.5		245 59.8		-18 0.0		234 17.5		-14 15.6		223 21.5		-9 59.8		212 59.7		-5 25.7	
40	276 55.2		-22 49.5		263 25.4		-20 55.4		250 49.7		-17 57.2		239 8.1		-14 12.2		228 12.6		-9 56.1		217 51.2		-5 21.8	
21 0	281 43.6	288.4	-22 48.5	1.1	268 14.5	289.1	-20 53.3	2.1	255 39.6	289.9	-17 54.3	2.9	243 58.7	290.6	-14 8.8	3.4	233 3.8	291.2	-9 52.4	3.7	222 42.8	291.6	-5 17.9	3.9
20	286 32.1		-22 47.4		273 3.6		-20 51.2		260 29.5		-17 51.5		248 49.3		-14 5.4		237 55.0		-9 48.7		227 34.3		-5 14.0	
40	291 20.5		-22 46.3		277 52.8		-20 49.1		265 19.4		-17 48.6		253 40.0		-14 2.0		242 46.1		-9 45.0		232 25.9		-5 10.1	
22 0	296 8.9	288.5	-22 45.2	1.2	282 41.9	289.2	-20 47.0	2.1	270 9.4	289.9	-17 45.7	2.9	258 30.6	290.6	-13 58.6	3.4	247 37.3	291.2	-9 41.2	3.7	237 17.5	291.6	-5 6.2	3.9
20	300 57.4		-22 44.0		287 31.1		-20 44.9		274 59.3		-17 42.8		263 21.2		-13 55.2		252 28.5		-9 37.5		242 9.0		-5 2.3	
40	305 45.9		-22 42.9		292 20.3		-20 42.7		279 49.3		-17 40.0		268 11.9		-13 51.8		257 19.7		-9 33.8		247 0.6		-4 58.4	
23 0	310 34.3	288.5	-22 41.7	1.2	297 9.5	289.2	-20 40.6	2.2	284 39.2	290.0	-17 37.1	2.9	273 2.5	290.7	-13 48.4	3.4	262 10.9	291.2	-9 30.1	3.8	251 52.2	291.6	-4 54.5	3.9
20	315 22.8		-22 40.6		301 58.7		-20 38.4		289 29.2		-17 34.2		277 53.2		-13 45.0		267 2.1		-9 26.3		256 43.7		-4 50.6	
40	320 11.3		-22 39.4		306 47.9		-20 36.3		294 19.2		-17 31.2		282 43.9		-13 41.6		271 53.4		-9 22.6		261 35.3		-4 46.7	

2011 Moon

h m	25 May GHA ° ′	d	Dec ° ′	d ′	26 May GHA ° ′	d	Dec ° ′	d ′	27 May GHA ° ′	d	Dec ° ′	d ′	28 May GHA ° ′	d	Dec ° ′	d ′	29 May GHA ° ′	d	Dec ° ′	d ′	30 May GHA ° ′	d	Dec ° ′	d ′
0 0	266 26.9	291.6	-4 42.8	3.9	256 27.8	291.7	-0 0.3	3.9	246 33.8	291.7	4 40.2	3.8	236 31.9	291.5	9 10.2	3.6	226 10.1	291.2	13 20.9	3.3	215 18.7	290.7	17 2.4	2.8
20	271 18.5		-4 38.9		261 19.6		0 3.7		251 25.6		4 44.0		241 23.4		9 13.8		231 1.3		13 24.2		220 9.4		17 5.2	
40	276 10.1		-4 35.0		266 11.3		0 7.6		256 17.3		4 47.9		246 14.9		9 17.4		235 52.5		13 27.5		225 0.1		17 8.0	
1 0	281 1.6	291.6	-4 31.1	3.9	271 3.1	291.7	0 11.5	3.9	261 9.0	291.7	4 51.7	3.8	251 6.5	291.5	9 21.1	3.6	240 43.6	291.2	13 30.8	3.3	229 50.8	290.7	17 10.8	2.8
20	285 53.2		-4 27.2		275 54.8		0 15.5		266 0.7		4 55.5		255 58.0		9 24.7		245 34.8		13 34.1		234 41.5		17 13.6	
40	290 44.8		-4 23.3		280 46.6		0 19.4		270 52.4		4 59.4		260 49.5		9 28.3		250 26.0		13 37.3		239 32.2		17 16.4	
2 0	295 36.4	291.6	-4 19.4	3.9	285 38.3	291.8	0 23.3	3.9	275 44.2	291.7	5 3.2	3.8	265 41.0	291.5	9 31.9	3.6	255 17.1	291.1	13 40.6	3.3	244 22.8	290.7	17 19.2	2.8
20	300 28.0		-4 15.5		290 30.1		0 27.2		280 35.9		5 7.0		270 32.5		9 35.5		260 8.2		13 43.9		249 13.5		17 22.0	
40	305 19.7		-4 11.6		295 21.8		0 31.2		285 27.6		5 10.9		275 24.0		9 39.2		264 59.4		13 47.1		254 4.2		17 24.7	
3 0	310 11.3	291.6	-4 7.7	3.9	300 13.6	291.8	0 35.1	3.9	290 19.3	291.7	5 14.7	3.8	280 15.5	291.5	9 42.8	3.6	269 50.5	291.1	13 50.4	3.2	258 54.8	290.6	17 27.5	2.7
20	315 2.9		-4 3.8		305 5.3		0 39.0		295 11.0		5 18.5		285 7.0		9 46.4		274 41.6		13 53.6		263 45.5		17 30.2	
40	319 54.5		-3 59.9		309 57.1		0 42.9		300 2.7		5 22.3		289 58.5		9 50.0		279 32.7		13 56.9		268 36.1		17 33.0	
4 0	324 46.1	291.6	-3 55.9	3.9	314 48.9	291.8	0 46.9	3.9	304 54.4	291.7	5 26.1	3.8	294 49.9	291.5	9 53.5	3.6	284 23.9	291.1	14 0.1	3.2	273 26.7	290.6	17 35.7	2.7
20	329 37.7		-3 52.0		319 40.6		0 50.8		309 46.1		5 29.9		299 41.4		9 57.1		289 15.0		14 3.4		278 17.3		17 38.4	
40	334 29.4		-3 48.1		324 32.4		0 54.7		314 37.8		5 33.8		304 32.9		10 0.7		294 6.1		14 6.6		283 8.0		17 41.1	
5 0	339 21.0	291.6	-3 44.2	3.9	329 24.1	291.8	0 58.6	3.9	319 29.5	291.7	5 37.6	3.8	309 24.4	291.5	10 4.3	3.6	298 57.2	291.1	14 9.8	3.2	287 58.6	290.6	17 43.8	2.7
20	344 12.6		-3 40.3		334 15.9		1 2.5		324 21.2		5 41.4		314 15.8		10 7.9		303 48.2		14 13.0		292 49.2		17 46.5	
40	349 4.3		-3 36.4		339 7.6		1 6.5		329 12.9		5 45.2		319 7.3		10 11.5		308 39.3		14 16.2		297 39.8		17 49.2	
6 0	353 55.9	291.6	-3 32.4	3.9	343 59.4	291.8	1 10.4	3.9	334 4.6	291.7	5 49.0	3.8	323 58.7	291.4	10 15.0	3.6	313 30.4	291.1	14 19.4	3.2	302 30.3	290.6	17 51.9	2.7
20	358 47.6		-3 28.5		348 51.2		1 14.3		338 56.3		5 52.8		328 50.2		10 18.6		318 21.5		14 22.6		307 20.9		17 54.6	
40	3 39.2		-3 24.6		353 42.9		1 18.2		343 48.0		5 56.6		333 41.6		10 22.1		323 12.5		14 25.8		312 11.5		17 57.2	
7 0	8 30.9	291.7	-3 20.7	3.9	358 34.7	291.8	1 22.1	3.9	348 39.6	291.7	6 0.4	3.8	338 33.1	291.4	10 25.7	3.5	328 3.6	291.0	14 29.0	3.2	317 2.1	290.5	17 59.9	2.6
20	13 22.5		-3 16.8		3 26.4		1 26.0		353 31.3		6 4.2		343 24.5		10 29.3		332 54.6		14 32.2		321 52.6		18 2.5	
40	18 14.2		-3 12.8		8 18.2		1 30.0		358 23.0		6 8.0		348 15.9		10 32.8		337 45.7		14 35.3		326 43.2		18 5.2	
8 0	23 5.8	291.7	-3 8.9	3.9	13 9.9	291.8	1 33.9	3.9	3 14.7	291.7	6 11.8	3.8	353 7.4	291.4	10 36.3	3.6	342 36.7	291.0	14 38.5	3.2	331 33.7	290.5	18 7.8	2.6
20	27 57.5		-3 5.0		18 1.7		1 37.8		8 6.4		6 15.5		357 58.8		10 39.9		347 27.7		14 41.7		336 24.2		18 10.4	
40	32 49.1		-3 1.1		22 53.5		1 41.7		12 58.0		6 19.3		2 50.2		10 43.4		352 18.8		14 44.8		341 14.8		18 13.0	
9 0	37 40.8	291.7	-2 57.1	3.9	27 45.2	291.8	1 45.6	3.9	17 49.7	291.7	6 23.1	3.8	7 41.6	291.4	10 47.0	3.5	357 9.8	291.0	14 48.0	3.1	346 5.3	290.5	18 15.7	2.6
20	42 32.5		-2 53.2		32 37.0		1 49.5		22 41.4		6 26.9		12 33.0		10 50.5		2 0.8		14 51.1		350 55.8		18 18.3	
40	47 24.1		-2 49.3		37 28.7		1 53.4		27 33.0		6 30.7		17 24.5		10 54.0		6 51.8		14 54.2		355 46.3		18 20.8	
10 0	52 15.8	291.7	-2 45.4	3.9	42 20.5	291.8	1 57.3	3.9	32 24.7	291.7	6 34.4	3.8	22 15.9	291.4	10 57.5	3.5	11 42.8	291.0	14 57.3	3.1	0 36.8	290.5	18 23.4	2.6
20	57 7.5		-2 41.4		47 12.3		2 1.2		37 16.4		6 38.2		27 7.3		11 1.0		16 33.8		15 0.5		5 27.3		18 26.0	
40	61 59.2		-2 37.5		52 4.0		2 5.1		42 8.0		6 42.0		31 58.6		11 4.5		21 24.8		15 3.6		10 17.8		18 28.5	
11 0	66 50.8	291.7	-2 33.6	3.9	56 55.8	291.8	2 9.0	3.9	46 59.7	291.7	6 45.7	3.8	36 50.0	291.4	11 8.0	3.5	26 15.7	291.0	15 6.7	3.1	15 8.3	290.5	18 31.1	2.5
20	71 42.5		-2 29.7		61 47.5		2 12.9		51 51.3		6 49.5		41 41.4		11 11.5		31 6.7		15 9.8		19 58.7		18 33.6	
40	76 34.2		-2 25.7		66 39.3		2 16.8		56 43.0		6 53.3		46 32.8		11 15.0		35 57.7		15 12.9		24 49.2		18 36.2	
12 0	81 25.9	291.7	-2 21.8	3.9	71 31.0	291.8	2 20.7	3.9	61 34.6	291.6	6 57.0	3.8	51 24.2	291.4	11 18.5	3.5	40 48.6	290.9	15 16.0	3.1	29 39.6	290.4	18 38.7	2.5
20	86 17.6		-2 17.9		76 22.8		2 24.6		66 26.3		7 0.8		56 15.5		11 22.0		45 39.6		15 19.0		34 30.1		18 41.2	
40	91 9.3		-2 13.9		81 14.6		2 28.5		71 17.9		7 4.5		61 6.9		11 25.5		50 30.5		15 22.1		39 20.5		18 43.7	
13 0	96 1.0	291.7	-2 10.0	3.9	86 6.3	291.8	2 32.4	3.9	76 9.6	291.6	7 8.3	3.7	65 58.3	291.3	11 29.0	3.5	55 21.5	290.9	15 25.2	3.0	44 11.0	290.4	18 46.2	2.5
20	100 52.7		-2 6.1		90 58.1		2 36.3		81 1.2		7 12.0		70 49.6		11 32.4		60 12.4		15 28.2		49 1.4		18 48.7	
40	105 44.4		-2 2.1		95 49.8		2 40.2		85 52.8		7 15.8		75 41.0		11 35.9		65 3.3		15 31.3		53 51.8		18 51.2	
14 0	110 36.1	291.7	-1 58.2	3.9	100 41.6	291.8	2 44.1	3.9	90 44.5	291.6	7 19.5	3.7	80 32.3	291.3	11 39.4	3.4	69 54.3	290.9	15 34.3	3.0	58 42.2	290.4	18 53.7	2.4
20	115 27.8		-1 54.3		105 33.3		2 48.0		95 36.1		7 23.2		85 23.6		11 42.8		74 45.2		15 37.4		63 32.6		18 56.1	
40	120 19.5		-1 50.4		110 25.1		2 51.9		100 27.7		7 27.0		90 15.0		11 46.3		79 36.1		15 40.4		68 23.0		18 58.6	
15 0	125 11.2	291.7	-1 46.4	3.9	115 16.8	291.8	2 55.8	3.9	105 19.3	291.6	7 30.7	3.7	95 6.3	291.3	11 49.7	3.4	84 27.0	290.9	15 43.4	3.0	73 13.4	290.4	19 1.0	2.4
20	130 2.9		-1 42.5		120 8.6		2 59.7		110 11.0		7 34.4		99 57.6		11 53.2		89 17.9		15 46.5		78 3.8		19 3.5	
40	134 54.6		-1 38.6		125 0.4		3 3.6		115 2.6		7 38.1		104 48.9		11 56.6		94 8.8		15 49.5		82 54.1		19 5.9	
16 0	139 46.3	291.7	-1 34.6	3.9	129 52.1	291.7	3 7.5	3.9	119 54.2	291.6	7 41.9	3.7	109 40.3	291.3	12 0.0	3.4	98 59.6	290.9	15 52.5	3.0	87 44.5	290.3	19 8.3	2.4
20	144 38.0		-1 30.7		134 43.9		3 11.3		124 45.8		7 45.6		114 31.6		12 3.5		103 50.5		15 55.5		92 34.9		19 10.7	
40	149 29.7		-1 26.8		139 35.6		3 15.2		129 37.4		7 49.3		119 22.9		12 6.9		108 41.4		15 58.5		97 25.2		19 13.1	
17 0	154 21.4	291.7	-1 22.8	3.9	144 27.4	291.7	3 19.1	3.9	134 29.0	291.6	7 53.0	3.7	124 14.2	291.3	12 10.3	3.4	113 32.2	290.8	16 1.4	3.0	102 15.6	290.3	19 15.5	2.4
20	159 13.2		-1 18.9		149 19.1		3 23.0		139 20.6		7 56.7		129 5.4		12 13.7		118 23.1		16 4.4		107 5.9		19 17.9	
40	164 4.9		-1 15.0		154 10.8		3 26.9		144 12.2		8 0.4		133 56.7		12 17.1		123 13.9		16 7.4		111 56.2		19 20.3	
18 0	168 56.6	291.7	-1 11.0	3.9	159 2.6	291.7	3 30.7	3.9	149 3.8	291.6	8 4.1	3.7	138 48.0	291.3	12 20.5	3.4	128 4.8	290.8	16 10.3	3.0	116 46.5	290.3	19 22.6	2.3
20	173 48.3		-1 7.1		163 54.3		3 34.6		153 55.4		8 7.8		143 39.3		12 23.9		132 55.6		16 13.3		121 36.9		19 25.0	
40	178 40.1		-1 3.2		168 46.1		3 38.5		158 47.0		8 11.5		148 30.6		12 27.3		137 46.4		16 16.2		126 27.2		19 27.3	
19 0	183 31.8	291.7	-0 59.2	3.9	173 37.8	291.7	3 42.3	3.9	163 38.6	291.6	8 15.2	3.7	153 21.8	291.3	12 30.7	3.4	142 37.3	290.8	16 19.2	2.9	131 17.5	290.3	19 29.6	2.3
20	188 23.5		-0 55.3		178 29.6		3 46.2		168 30.1		8 18.9		158 13.1		12 34.1		147 28.1		16 22.1		136 7.7		19 32.0	
40	193 15.2		-0 51.4		183 21.3		3 50.1		173 21.7		8 22.6		163 4.3		12 37.5		152 18.9		16 25.0		140 58.0		19 34.3	
20 0	198 7.0	291.7	-0 47.4	3.9	188 13.1	291.7	3 53.9	3.9	178 13.3	291.6	8 26.3	3.7	167 55.6	291.2	12 40.8	3.4	157 9.7	290.8	16 28.0	2.9	145 48.3	290.3	19 36.6	2.3
20	202 58.7		-0 43.5		193 4.8		3 57.8		183 4.9		8 29.9		172 46.8		12 44.2		162 0.5		16 30.9		150 38.6		19 38.9	
40	207 50.4		-0 39.6		197 56.5		4 1.7		187 56.4		8 33.6		177 38.1		12 47.6		166 51.2		16 33.8		155 28.8		19 41.1	
21 0	212 42.2	291.7	-0 35.6	3.9	202 48.3	291.7	4 5.5	3.9	192 48.0	291.6	8 37.3	3.7	182 29.3	291.2	12 50.9	3.4	171 42.0	290.8	16 36.7	2.9	160 19.1	290.2	19 43.4	2.3
20	217 33.9		-0 31.7		207 40.0		4 9.4		197 39.5		8 41.0		187 20.5		12 54.3		176 32.8		16 39.6		165 9.3		19 45.7	
40	222 25.6		-0 27.8		212 31.7		4 13.2		202 31.1		8 44.6		192 11.8		12 57.6		181 23.6		16 42.4		169 59.6		19 47.9	
22 0	227 17.4	291.7	-0 23.8	3.9	217 23.5	291.7	4 17.1	3.8	207 22.7	291.5	8 48.3	3.6	197 3.0	291.2	13 1.0	3.3	186 14.3	290.7	16 45.3	2.9	174 49.8	290.2	19 50.2	2.2
20	232 9.1		-0 19.9		222 15.2		4 20.9		212 14.2		8 51.9		201 54.2		13 4.3		191 5.1		16 48.2		179 40.0		19 52.4	
40	237 0.9		-0 16.0		227 6.9		4 24.8		217 5.7		8 55.6		206 45.4		13 7.6		195 55.8		16 51.0		184 30.2		19 54.6	
23 0	241 52.6	291.7	-0 12.0	3.9	231 58.7	291.7	4 28.6	3.9	221 57.3	291.5	8 59.2	3.7	211 36.6	291.2	13 11.0	3.3	200 46.5	290.7	16 53.9	2.8	189 20.5	290.2	19 56.9	2.2
20	246 44.4		-0 8.1		236 50.4		4 32.5		226 48.8		9 2.9		216 27.8		13 14.3		205 37.3		16 56.7		194 10.7		19 59.1	
40	251 36.1		-0 4.2		241 42.1		4 36.3		231 40.4		9 6.5		221 19.0		13 17.6		210 28.0		16 59.6		199 0.9		20 1.3	

2011 Moon

	31 May				1 Jun				2 Jun				3 Jun				4 Jun				5 Jun			
	GHA		Dec		GHA		Dec		GHA		Dec		GHA		Dec		GHA		Dec		GHA		Dec	
h m	° ′	d	° ′	d ′	° ′	d	° ′	d ′	° ′	d	° ′	d ′	° ′	d	° ′	d ′	° ′	d	° ′	d ′	° ′	d	° ′	d ′
0 0	203 51.0	290.2	20 3.4	2.2	191 45.7	289.7	22 12.1	1.4	179 7.8	289.3	23 17.2	0.4	166 9.1	289.1	23 10.5	-0.6	153 4.9	289.1	21 48.7	-1.7	140 9.9	289.4	19 14.4	-2.6
20	208 41.2		20 5.6		196 35.4		22 13.5		183 57.1		23 17.6		170 58.2		23 9.9		157 54.1		21 47.0		144 59.2		19 11.8	
40	213 31.4		20 7.8		201 25.0		22 14.8		188 46.4		23 18.0		175 47.3		23 9.3		162 43.2		21 45.4		149 48.6		19 9.1	
1 0	218 21.6	290.2	20 9.9	2.1	206 14.7	289.7	22 16.2	1.3	193 35.7	289.3	23 18.4	0.4	180 36.4	289.1	23 8.6	-0.7	167 32.4	289.2	21 43.7	-1.7	154 37.9	289.4	19 6.5	-2.7
20	223 11.7		20 12.1		211 4.4		22 17.5		198 25.0		23 18.8		185 25.5		23 8.0		172 21.5		21 42.0		159 27.3		19 3.8	
40	228 1.9		20 14.2		215 54.0		22 18.8		203 14.3		23 19.2		190 14.6		23 7.3		177 10.7		21 40.2		164 16.7		19 1.2	
2 0	232 52.0	290.1	20 16.3	2.1	220 43.7	289.6	22 20.1	1.3	208 3.5	289.3	23 19.5	0.3	195 3.7	289.1	23 6.6	-0.7	181 59.8	289.2	21 38.5	-1.8	169 6.0	289.4	18 58.5	-2.7
20	237 42.1		20 18.4		225 33.3		22 21.4		212 52.8		23 19.8		199 52.8		23 5.9		186 49.0		21 36.8		173 55.4		18 55.8	
40	242 32.3		20 20.5		230 22.9		22 22.7		217 42.1		23 20.1		204 42.0		23 5.1		191 38.1		21 35.0		178 44.8		18 53.1	
3 0	247 22.4	290.1	20 22.6	2.1	235 12.6	289.6	22 23.9	1.2	222 31.3	289.3	23 20.4	0.3	209 31.1	289.1	23 4.4	-0.8	196 27.3	289.2	21 33.2	-1.8	183 34.2	289.4	18 50.4	-2.8
20	252 12.5		20 24.7		240 2.2		22 25.2		227 20.6		23 20.7		214 20.2		23 3.7		201 16.5		21 31.5		188 23.6		18 47.6	
40	257 2.6		20 26.8		244 51.8		22 26.4		232 9.9		23 21.0		219 9.3		23 2.9		206 5.6		21 29.7		193 12.9		18 44.9	
4 0	261 52.7	290.1	20 28.8	2.1	249 41.4	289.6	22 27.6	1.2	236 59.1	289.2	23 21.3	0.2	223 58.4	289.1	23 2.1	-0.8	210 54.8	289.2	21 27.8	-1.8	198 2.3	289.4	18 42.1	-2.8
20	266 42.8		20 30.9		254 31.0		22 28.9		241 48.4		23 21.5		228 47.5		23 1.3		215 44.0		21 26.0		202 51.7		18 39.4	
40	271 32.9		20 32.9		259 20.6		22 30.1		246 37.6		23 21.7		233 36.6		23 0.5		220 33.1		21 24.2		207 41.1		18 36.6	
5 0	276 23.0	290.1	20 35.0	2.0	264 10.2	289.6	22 31.2	1.2	251 26.8	289.2	23 22.0	0.2	238 25.7	289.1	22 59.7	-0.9	225 22.3	289.2	21 22.3	-1.9	212 30.5	289.4	18 33.8	-2.8
20	281 13.0		20 37.0		268 59.8		22 32.4		256 16.1		23 22.2		243 14.8		22 58.8		230 11.5		21 20.5		217 20.0		18 31.0	
40	286 3.1		20 39.0		273 49.4		22 33.6		261 5.3		23 22.3		248 3.9		22 58.0		235 0.7		21 18.6		222 9.4		18 28.2	
6 0	290 53.2	290.0	20 41.0	2.0	278 38.9	289.6	22 34.7	1.1	265 54.5	289.2	23 22.5	0.1	252 53.0	289.1	22 57.1	-0.9	239 49.8	289.2	21 16.7	-1.9	226 58.8	289.4	18 25.3	-2.8
20	295 43.2		20 43.0		283 28.5		22 35.9		270 43.8		23 22.7		257 42.0		22 56.2		244 39.0		21 14.8		231 48.2		18 22.5	
40	300 33.2		20 44.9		288 18.1		22 37.0		275 33.0		23 22.8		262 31.1		22 55.3		249 28.2		21 12.8		236 37.6		18 19.7	
7 0	305 23.3	290.0	20 46.9	1.9	293 7.6	289.5	22 38.1	1.1	280 22.2	289.2	23 22.9	0.1	267 20.2	289.1	22 54.4	-0.9	254 17.4	289.2	21 10.9	-2.0	241 27.1	289.4	18 16.8	-2.9
20	310 13.3		20 48.9		297 57.2		22 39.2		285 11.4		23 23.1		272 9.3		22 53.5		259 6.6		21 8.9		246 16.5		18 13.9	
40	315 3.3		20 50.8		302 46.7		22 40.3		290 0.6		23 23.2		276 58.4		22 52.5		263 55.8		21 7.0		251 5.9		18 11.0	
8 0	319 53.3	290.0	20 52.7	1.9	307 36.2	289.5	22 41.4	1.0	294 49.9	289.2	23 23.3	0.0	281 47.5	289.1	22 51.6	-1.0	268 45.0	289.2	21 5.0	-2.0	255 55.4	289.4	18 8.1	-2.9
20	324 43.3		20 54.7		312 25.8		22 42.4		299 39.1		23 23.3		286 36.6		22 50.6		273 34.2		21 3.0		260 44.8		18 5.2	
40	329 33.3		20 56.6		317 15.3		22 43.5		304 28.3		23 23.4		291 25.7		22 49.6		278 23.4		21 1.0		265 34.3		18 2.3	
9 0	334 23.3	290.0	20 58.5	1.9	322 4.8	289.5	22 44.5	1.0	309 17.5	289.2	23 23.4	0.0	296 14.8	289.1	22 48.6	-1.0	283 12.6	289.2	20 59.0	-2.1	270 23.7	289.5	17 59.4	-3.0
20	339 13.3		21 0.3		326 54.3		22 45.5		314 6.7		23 23.5		301 3.9		22 47.6		288 1.8		20 57.0		275 13.2		17 56.4	
40	344 3.3		21 2.2		331 43.8		22 46.5		318 55.9		23 23.5		305 53.0		22 46.6		292 51.0		20 54.9		280 2.6		17 53.5	
10 0	348 53.3	290.0	21 4.1	1.8	336 33.3	289.5	22 47.5	1.0	323 45.1	289.2	23 23.5	0.0	310 42.1	289.1	22 45.5	-1.1	297 40.2	289.2	20 52.8	-2.1	284 52.1	289.5	17 50.5	-3.0
20	353 43.2		21 5.9		341 22.8		22 48.5		328 34.2		23 23.5		315 31.2		22 44.5		302 29.4		20 50.8		289 41.5		17 47.5	
40	358 33.2		21 7.8		346 12.3		22 49.5		333 23.4		23 23.4		320 20.3		22 43.4		307 18.6		20 48.7		294 31.0		17 44.5	
11 0	3 23.1	289.9	21 9.6	1.8	351 1.8	289.5	22 50.4	0.9	338 12.6	289.2	23 23.4	-0.1	325 9.4	289.1	22 42.3	-1.1	312 7.9	289.2	20 46.6	-2.1	299 20.5	289.5	17 41.5	-3.0
20	8 13.1		21 11.4		355 51.3		22 51.4		343 1.8		23 23.4		329 58.5		22 41.2		316 57.1		20 44.5		304 10.0		17 38.5	
40	13 3.0		21 13.3		0 40.8		22 52.3		347 51.0		23 23.3		334 47.6		22 40.1		321 46.3		20 42.3		308 59.5		17 35.5	
12 0	17 52.9	289.9	21 15.1	1.8	5 30.2	289.5	22 53.2	0.9	352 40.2	289.2	23 23.2	-0.1	339 36.7	289.1	22 39.0	-1.2	326 35.5	289.2	20 40.2	-2.2	313 48.9	289.5	17 32.4	-3.0
20	22 42.8		21 16.8		10 19.7		22 54.1		357 29.3		23 23.1		344 25.8		22 37.8		331 24.8		20 38.0		318 38.4		17 29.4	
40	27 32.8		21 18.6		15 9.2		22 55.0		2 18.5		23 23.0		349 14.9		22 36.7		336 14.0		20 35.9		323 27.9		17 26.3	
13 0	32 22.7	289.9	21 20.4	1.7	19 58.6	289.4	22 55.9	0.8	7 7.7	289.2	23 22.9	-0.2	354 4.0	289.1	22 35.5	-1.2	341 3.2	289.2	20 33.7	-2.2	328 17.4	289.5	17 23.3	-3.1
20	37 12.6		21 22.1		24 48.1		22 56.8		11 56.8		23 22.7		358 53.1		22 34.3		345 52.5		20 31.5		333 6.9		17 20.2	
40	42 2.4		21 23.9		29 37.5		22 57.6		16 46.0		23 22.6		3 42.2		22 33.1		350 41.7		20 29.3		337 56.4		17 17.1	
14 0	46 52.3	289.9	21 25.6	1.7	34 26.9	289.4	22 58.4	0.8	21 35.2	289.2	23 22.4	-0.2	8 31.3	289.1	22 31.9	-1.3	355 31.0	289.3	20 27.1	-2.3	342 46.0	289.5	17 14.0	-3.1
20	51 42.2		21 27.3		39 16.4		22 59.3		26 24.3		23 22.2		13 20.4		22 30.7		0 20.2		20 24.8		347 35.5		17 10.9	
40	56 32.1		21 29.0		44 5.8		23 0.1		31 13.5		23 22.0		18 9.5		22 29.4		5 9.5		20 22.6		352 25.0		17 7.7	
15 0	61 21.9	289.9	21 30.7	1.7	48 55.2	289.4	23 0.9	0.8	36 2.6	289.1	23 21.8	-0.2	22 58.6	289.1	22 28.1	-1.3	9 58.7	289.3	20 20.3	-2.3	357 14.5	289.5	17 4.6	-3.2
20	66 11.8		21 32.4		53 44.6		23 1.7		40 51.8		23 21.6		27 47.7		22 26.9		14 48.0		20 18.1		2 4.0		17 1.4	
40	71 1.7		21 34.1		58 34.1		23 2.4		45 40.9		23 21.3		32 36.9		22 25.6		19 37.2		20 15.8		6 53.6		16 58.3	
16 0	75 51.5	289.8	21 35.8	1.6	63 23.5	289.4	23 3.2	0.7	50 30.1	289.1	23 21.1	-0.3	37 26.0	289.1	22 24.3	-1.3	24 26.5	289.3	20 13.5	-2.3	11 43.1	289.5	16 55.1	-3.2
20	80 41.3		21 37.4		68 12.9		23 3.9		55 19.2		23 20.8		42 15.1		22 23.0		29 15.8		20 11.2		16 32.7		16 51.9	
40	85 31.2		21 39.1		73 2.3		23 4.6		60 8.4		23 20.5		47 4.2		22 21.6		34 5.0		20 8.8		21 22.2		16 48.7	
17 0	90 21.0	289.8	21 40.7	1.6	77 51.7	289.4	23 5.4	0.7	64 57.5	289.1	23 20.2	-0.3	51 53.3	289.1	22 20.3	-1.4	38 54.3	289.3	20 6.5	-2.4	26 11.7	289.6	16 45.5	-3.2
20	95 10.8		21 42.3		82 41.0		23 6.1		69 46.7		23 19.9		56 42.4		22 18.9		43 43.6		20 4.1		31 1.3		16 42.3	
40	100 0.6		21 43.9		87 30.4		23 6.8		74 35.8		23 19.6		61 31.5		22 17.5		48 32.9		20 1.8		35 50.9		16 39.1	
18 0	104 50.4	289.8	21 45.5	1.6	92 19.8	289.4	23 7.4	0.7	79 24.9	289.1	23 19.2	-0.4	66 20.6	289.1	22 16.1	-1.4	53 22.2	289.3	19 59.4	-2.4	40 40.4	289.6	16 35.9	-3.3
20	109 40.2		21 47.1		97 9.2		23 8.1		84 14.1		23 18.9		71 9.7		22 14.7		58 11.4		19 57.0		45 30.0		16 32.6	
40	114 30.0		21 48.6		101 58.6		23 8.7		89 3.2		23 18.5		75 58.9		22 13.3		63 0.7		19 54.6		50 19.5		16 29.3	
19 0	119 19.8	289.8	21 50.2	1.5	106 47.9	289.4	23 9.4	0.6	93 52.3	289.1	23 18.1	-0.4	80 48.0	289.1	22 11.9	-1.5	67 50.0	289.3	19 52.2	-2.5	55 9.1	289.6	16 26.1	-3.3
20	124 9.5		21 51.7		111 37.3		23 10.0		98 41.5		23 17.7		85 37.1		22 10.4		72 39.3		19 49.7		59 58.7		16 22.8	
40	128 59.3		21 53.3		116 26.6		23 10.6		103 30.6		23 17.3		90 26.2		22 9.0		77 28.6		19 47.3		64 48.3		16 19.5	
20 0	133 49.1	289.7	21 54.8	1.5	121 16.0	289.3	23 11.2	0.6	108 19.7	289.1	23 16.8	-0.4	95 15.3	289.1	22 7.5	-1.5	82 17.9	289.3	19 44.8	-2.5	69 37.9	289.6	16 16.2	-3.3
20	138 38.8		21 56.3		126 5.3		23 11.8		113 8.8		23 16.4		100 4.5		22 6.0		87 7.2		19 42.4		74 27.5		16 12.9	
40	143 28.6		21 57.8		130 54.7		23 12.3		117 58.0		23 15.9		104 53.6		22 4.5		91 56.6		19 39.9		79 17.0		16 9.6	
21 0	148 18.3	289.7	21 59.3	1.5	135 44.0	289.3	23 12.9	0.5	122 47.1	289.1	23 15.5	-0.5	109 42.7	289.1	22 3.0	-1.5	96 45.9	289.3	19 37.4	-2.5	84 6.6	289.6	16 6.2	-3.3
20	153 8.1		22 0.8		140 33.3		23 13.4		127 36.2		23 15.0		114 31.8		22 1.5		101 35.2		19 34.9		88 56.2		16 2.9	
40	157 57.8		22 2.2		145 22.7		23 13.9		132 25.3		23 14.5		119 21.0		21 59.9		106 24.5		19 32.4		93 45.9		15 59.5	
22 0	162 47.5	289.7	22 3.7	1.4	150 12.0	289.3	23 14.5	0.5	137 14.4	289.1	23 13.9	-0.5	124 10.1	289.1	21 58.4	-1.6	111 13.8	289.3	19 29.8	-2.5	98 35.5	289.6	15 56.2	-3.4
20	167 37.2		22 5.1		155 1.3		23 15.0		142 3.5		23 13.4		128 59.2		21 56.8		116 3.2		19 27.3		103 25.1		15 52.8	
40	172 26.9		22 6.5		159 50.6		23 15.4		146 52.7		23 12.9		133 48.4		21 55.2		120 52.5		19 24.7		108 14.7		15 49.4	
23 0	177 16.6	289.7	22 7.9	1.4	164 39.9	289.3	23 15.9	0.4	151 41.8	289.1	23 12.3	-0.6	138 37.5	289.1	21 53.6	-1.6	125 41.8	289.3	19 22.2	-2.6	113 4.3	289.6	15 46.0	-3.4
20	182 6.3		22 9.3		169 29.2		23 16.4		156 30.9		23 11.7		143 26.7		21 52.0		130 31.2		19 19.6		117 53.9		15 42.6	
40	186 56.0		22 10.7		174 18.5		23 16.8		161 20.0		23 11.1		148 15.8		21 50.3		135 20.5		19 17.0		122 43.6		15 39.2	

2011 Moon

	6 Jun						7 Jun						8 Jun						9 Jun						10 Jun						11 Jun					
	GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec		
h m	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'
0 0	127	33.2	289.6	15	35.8	-3.5	115	16.9	289.9	11	5.0	-4.1	103	15.9	290.1	5	56.5	-4.5	91	20.2	290.0	0	26.0	-4.7	79	16.9	289.8	-5	9.4	-4.6	66	52.7	289.5	-10	31.4	-4.3
20	132	22.8		15	32.3		120	6.8		11	0.9		108	5.9		5	52.0		96	10.2		0	21.4		84	6.7		-5	14.0		71	42.2		-10	35.7	
40	137	12.5		15	28.9		124	56.7		10	56.9		112	56.0		5	47.5		101	0.2		0	16.7		88	56.6		-5	18.6		76	31.6		-10	40.0	
1 0	142	2.1	289.7	15	25.4	-3.5	129	46.6	289.9	10	52.8	-4.1	117	46.0	290.1	5	43.0	-4.5	105	50.3	290.0	0	12.0	-4.7	93	46.4	289.8	-5	23.2	-4.6	81	21.1	289.4	-10	44.3	-4.2
20	146	51.8		15	22.0		134	36.5		10	48.7		122	36.1		5	38.5		110	40.3		0	7.4		98	36.2		-5	27.8		86	10.5		-10	48.5	
40	151	41.4		15	18.5		139	26.4		10	44.6		127	26.1		5	34.0		115	30.3		0	2.7		103	26.0		-5	32.4		90	60.0		-10	52.8	
2 0	156	31.1	289.7	15	15.0	-3.5	144	16.3	289.9	10	40.5	-4.1	132	16.2	290.1	5	29.5	-4.5	120	20.4	290.0	-0	2.0	-4.7	108	15.9	289.8	-5	37.0	-4.6	95	49.4	289.4	-10	57.0	-4.3
20	161	20.8		15	11.5		149	6.2		10	36.4		137	6.2		5	25.0		125	10.4		-0	6.6		113	5.7		-5	41.6		100	38.8		-11	1.3	
40	166	10.4		15	8.0		153	56.1		10	32.3		141	56.3		5	20.5		130	0.4		-0	11.3		117	55.5		-5	46.2		105	28.2		-11	5.5	
3 0	171	0.1	289.7	15	4.5	-3.5	158	46.1	289.9	10	28.2	-4.1	146	46.4	290.1	5	16.0	-4.5	134	50.4	290.0	-0	16.0	-4.7	122	45.3	289.8	-5	50.7	-4.6	110	17.6	289.4	-11	9.8	-4.2
20	175	49.8		15	1.0		163	36.0		10	24.1		151	36.4		5	11.5		139	40.5		-0	20.6		127	35.1		-5	55.3		115	7.0		-11	14.0	
40	180	39.4		14	57.4		168	25.9		10	19.9		156	26.5		5	7.0		144	30.5		-0	25.3		132	24.9		-5	59.9		119	56.4		-11	18.2	
4 0	185	29.1	289.7	14	53.9	-3.6	173	15.8	289.9	10	15.8	-4.2	161	16.5	290.1	5	2.5	-4.5	149	20.5	290.0	-0	30.0	-4.7	137	14.7	289.8	-6	4.5	-4.6	124	45.8	289.4	-11	22.4	-4.2
20	190	18.8		14	50.4		178	5.8		10	11.6		166	6.6		4	58.0		154	10.5		-0	34.7		142	4.5		-6	9.1		129	35.2		-11	26.6	
40	195	8.5		14	46.8		182	55.7		10	7.5		170	56.7		4	53.4		159	0.5		-0	39.3		146	54.2		-6	13.6		134	24.6		-11	30.8	
5 0	199	58.2	289.7	14	43.2	-3.6	187	45.7	289.9	10	3.3	-4.2	175	46.7	290.1	4	48.9	-4.5	163	50.6	290.0	-0	44.0	-4.7	151	44.0	289.8	-6	18.2	-4.6	139	14.0	289.4	-11	35.0	-4.2
20	204	47.9		14	39.6		192	35.6		9	59.2		180	36.8		4	44.4		168	40.6		-0	48.7		156	33.8		-6	22.8		144	3.3		-11	39.2	
40	209	37.6		14	36.0		197	25.5		9	55.0		185	26.8		4	39.8		173	30.6		-0	53.4		161	23.5		-6	27.3		148	52.7		-11	43.4	
6 0	214	27.3	289.7	14	32.4	-3.6	202	15.5	290.0	9	50.8	-4.2	190	16.9	290.1	4	35.3	-4.6	178	20.6	290.0	-0	58.0	-4.7	166	13.3	289.8	-6	31.9	-4.5	153	42.0	289.3	-11	47.6	-4.1
20	219	17.0		14	28.8		207	5.4		9	46.6		195	7.0		4	30.7		183	10.6		-1	2.7		171	3.1		-6	36.4		158	31.4		-11	51.7	
40	224	6.7		14	25.2		211	55.4		9	42.4		199	57.0		4	26.2		188	0.6		-1	7.4		175	52.8		-6	41.0		163	20.7		-11	55.9	
7 0	228	56.4	289.7	14	21.6	-3.7	216	45.4	290.0	9	38.2	-4.2	204	47.1	290.1	4	21.6	-4.5	192	50.6	290.0	-1	12.1	-4.7	180	42.6	289.7	-6	45.5	-4.5	168	10.0	289.3	-12	0.0	-4.1
20	233	46.2		14	17.9		221	35.3		9	34.0		209	37.2		4	17.1		197	40.6		-1	16.7		185	32.3		-6	50.1		172	59.4		-12	4.2	
40	238	35.9		14	14.3		226	25.3		9	29.8		214	27.2		4	12.5		202	30.6		-1	21.4		190	22.1		-6	54.6		177	48.7		-12	8.3	
8 0	243	25.6	289.7	14	10.6	-3.7	231	15.2	290.0	9	25.6	-4.2	219	17.3	290.1	4	8.0	-4.6	207	20.6	290.0	-1	26.1	-4.7	195	11.8	289.7	-6	59.1	-4.5	182	38.0	289.3	-12	12.4	-4.1
20	248	15.4		14	7.0		236	5.2		9	21.4		224	7.4		4	3.4		212	10.6		-1	30.8		200	1.5		-7	3.7		187	27.3		-12	16.5	
40	253	5.1		14	3.3		240	55.2		9	17.1		228	57.4		3	58.8		217	0.6		-1	35.4		204	51.2		-7	8.2		192	16.6		-12	20.7	
9 0	257	54.8	289.7	13	59.6	-3.7	245	45.1	290.0	9	12.9	-4.3	233	47.5	290.1	3	54.2	-4.6	221	50.6	290.0	-1	40.1	-4.7	209	41.0	289.7	-7	12.7	-4.5	197	5.9	289.3	-12	24.8	-4.1
20	262	44.6		13	55.9		250	35.1		9	8.7		238	37.6		3	49.7		226	40.5		-1	44.8		214	30.7		-7	17.2		201	55.2		-12	28.8	
40	267	34.3		13	52.2		255	25.1		9	4.4		243	27.6		3	45.1		231	30.5		-1	49.5		219	20.4		-7	21.8		206	44.4		-12	32.9	
10 0	272	24.1	289.8	13	48.5	-3.7	260	15.1	290.0	9	0.1	-4.3	248	17.7	290.1	3	40.5	-4.6	236	20.5	290.0	-1	54.1	-4.7	224	10.1	289.7	-7	26.3	-4.5	211	33.7	289.3	-12	37.0	-4.1
20	277	13.8		13	44.8		265	5.0		8	55.9		253	7.8		3	35.9		241	10.5		-1	58.8		228	59.8		-7	30.8		216	23.0		-12	41.1	
40	282	3.6		13	41.1		269	55.0		8	51.6		257	57.8		3	31.3		246	0.5		-2	3.5		233	49.5		-7	35.3		221	12.2		-12	45.1	
11 0	286	53.3	289.8	13	37.3	-3.8	274	45.0	290.0	8	47.3	-4.3	262	47.9	290.1	3	26.8	-4.6	250	50.4	290.0	-2	8.1	-4.7	238	39.2	289.7	-7	39.8	-4.5	226	1.5	289.2	-12	49.2	-4.0
20	291	43.1		13	33.6		279	35.0		8	43.1		267	38.0		3	22.2		255	40.4		-2	12.8		243	28.9		-7	44.3		230	50.7		-12	53.2	
40	296	32.9		13	29.8		284	25.0		8	38.8		272	28.0		3	17.6		260	30.4		-2	17.5		248	18.5		-7	48.8		235	39.9		-12	57.3	
12 0	301	22.7	289.8	13	26.0	-3.8	289	15.0	290.0	8	34.5	-4.3	277	18.1	290.1	3	13.0	-4.6	265	20.3	290.0	-2	22.1	-4.7	253	8.2	289.7	-7	53.3	-4.5	240	29.2	289.2	-13	1.3	-4.0
20	306	12.4		13	22.3		294	5.0		8	30.2		282	8.2		3	8.4		270	10.3		-2	26.8		257	57.9		-7	57.7		245	18.4		-13	5.3	
40	311	2.2		13	18.5		298	55.0		8	25.9		286	58.3		3	3.8		275	0.2		-2	31.5		262	47.5		-8	2.2		250	7.6		-13	9.4	
13 0	315	52.0	289.8	13	14.7	-3.8	303	45.0	290.0	8	21.6	-4.3	291	48.3	290.1	2	59.2	-4.6	279	50.2	289.9	-2	36.2	-4.6	267	37.2	289.6	-8	6.7	-4.5	254	56.8	289.2	-13	13.4	-4.0
20	320	41.8		13	10.9		308	35.0		8	17.3		296	38.4		2	54.5		284	40.2		-2	40.8		272	26.8		-8	11.2		259	46.0		-13	17.4	
40	325	31.6		13	7.1		313	25.0		8	12.9		301	28.4		2	49.9		289	30.1		-2	45.5		277	16.5		-8	15.6		264	35.2		-13	21.3	
14 0	330	21.4	289.8	13	3.3	-3.8	318	15.0	290.0	8	8.6	-4.3	306	18.5	290.1	2	45.3	-4.6	294	20.1	289.9	-2	50.1	-4.7	282	6.1	289.6	-8	20.1	-4.4	269	24.4	289.2	-13	25.3	-4.0
20	335	11.2		12	59.4		323	5.0		8	4.3		311	8.6		2	40.7		299	10.0		-2	54.8		286	55.8		-8	24.5		274	13.6		-13	29.3	
40	340	1.0		12	55.6		327	55.0		8	0.0		315	58.6		2	36.1		303	59.9		-2	59.5		291	45.4		-8	29.0		279	2.7		-13	33.2	
15 0	344	50.8	289.8	12	51.8	-3.9	332	45.0	290.0	7	55.6	-4.3	320	48.7	290.1	2	31.5	-4.6	308	49.9	289.9	-3	4.1	-4.7	296	35.0	289.6	-8	33.4	-4.4	283	51.9	289.2	-13	37.2	-3.9
20	349	40.6		12	47.9		337	35.0		7	51.3		325	38.8		2	26.9		313	39.8		-3	8.8		301	24.6		-8	37.9		288	41.1		-13	41.1	
40	354	30.4		12	44.1		342	25.0		7	46.9		330	28.8		2	22.2		318	29.7		-3	13.4		306	14.3		-8	42.3		293	30.2		-13	45.1	
16 0	359	20.2	289.8	12	40.2	-3.9	347	15.0	290.0	7	42.6	-4.4	335	18.9	290.1	2	17.6	-4.6	323	19.7	289.9	-3	18.1	-4.7	311	3.9	289.6	-8	46.7	-4.4	298	19.3	289.1	-13	49.0	-3.9
20	4	10.1		12	36.3		352	5.0		7	38.2		340	9.0		2	13.0		328	9.6		-3	22.8		315	53.5		-8	51.2		303	8.5		-13	52.9	
40	8	59.9		12	32.4		356	55.1		7	33.8		344	59.0		2	8.3		332	59.5		-3	27.4		320	43.1		-8	55.6		307	57.6		-13	56.8	
17 0	13	49.7	289.8	12	28.5	-3.9	1	45.1	290.0	7	29.4	-4.4	349	49.1	290.1	2	3.7	-4.6	337	49.4	289.9	-3	32.1	-4.6	325	32.7	289.6	-9	0.0	-4.4	312	46.7	289.1	-14	0.7	-3.9
20	18	39.5		12	24.6		6	35.1		7	25.1		354	39.1		1	59.1		342	39.4		-3	36.7		330	22.3		-9	4.4		317	35.8		-14	4.6	
40	23	29.4		12	20.7		11	25.1		7	20.7		359	29.2		1	54.4		347	29.3		-3	41.4		335	11.8		-9	8.8		322	25.0		-14	8.5	
18 0	28	19.2	289.8	12	16.8	-3.9	16	15.2	290.0	7	16.3	-4.4	4	19.3	290.1	1	49.8	-4.6	352	19.2	289.9	-3	46.0	-4.7	340	1.4	289.6	-9	13.2	-4.4	327	14.1	289.1	-14	12.4	-3.8
20	33	9.1		12	12.9		21	5.2		7	11.9		9	9.3		1	45.2		357	9.1		-3	50.7		344	51.0		-9	17.6		332	3.1		-14	16.2	
40	37	58.9		12	9.0		25	55.2		7	7.5		13	59.4		1	40.5		1	59.0		-3	55.3		349	40.5		-9	22.0		336	52.2		-14	20.1	
19 0	42	48.7	289.9	12	5.0	-3.9	30	45.2	290.0	7	3.1	-4.4	18	49.4	290.1	1	35.9	-4.7	6	48.9	289.9	-4	0.0	-4.6	354	30.1	289.5	-9	26.4	-4.4	341	41.3	289.1	-14	23.9	-3.8
20	47	38.6		12	1.1		35	35.3		6	58.7		23	39.5		1	31.2		11	38.8		-4	4.6		359	19.6		-9	30.8		346	30.4		-14	27.8	
40	52	28.5		11	57.1		40	25.3		6	54.3		28	29.6		1	26.6		16	28.7		-4	9.2		4	9.2		-9	35.1		351	19.4		-14	31.6	
20 0	57	18.3	289.9	11	53.2	-4.0	45	15.3	290.0	6	49.9	-4.4	33	19.6	290.1	1	21.9	-4.6	21	18.5	289.9	-4	13.9	-4.6	8	58.7	289.5	-9	39.5	-4.4	356	8.5	289.0	-14	35.4	-3.8
20	62	8.2		11	49.2		50	5.4		6	45.4		38	9.7		1	17.3		26	8.4		-4	18.5		13	48.3		-9	43.8		0	57.6		-14	39.2	
40	66	58.0		11	45.2		54	55.4		6	41.0		42	59.7		1	12.6		30	58.3		-4	23.1		18	37.8		-9	48.2		5	46.6		-14	43.0	
21 0	71	47.9	289.9	11	41.2	-4.0	59	45.5	290.0	6	36.6	-4.5	47	49.8	290.0	1	8.0	-4.7	35	48.2	289.9	-4	27.8	-4.6	23	27.3	289.5	-9	52.6	-4.3	10	35.6	289.0	-14	46.8	-3.8
20	76	37.8		11	37.2		64	35.5		6	32.1		52	39.8		1	3.3		40	38.1		-4	32.4		28	16.8		-9	56.9		15	24.7		-14	50.6	
40	81	27.7		11	33.2		69	25.5		6	27.7		57	29.9		0	58.7		45	27.9		-4	37.0		33	6.3		-10	1.2		20	13.7		-14	54.3	
22 0	86	17.5	289.9	11	29.2	-4.0	74	15.6	290.0	6	23.2	-4.4	62	19.9	290.0	0	54.0	-4.7	50	17.8	289.9	-4	41.7	-4.6	37	55.8	289.5	-10	5.6	-4.3	25	2.7	289.0	-14	58.1	-3.7
20	91	7.4		11	25.2		79	5.6		6	18.8		67	10.0		0	49.4		55	7.7		-4	46.3		42	45.3		-10	9.9		29	51.7		-15	1.8	
40	95	57.3		11	21.2		83	55.7		6	14.3		71	60.0		0	44.7		59	57.5		-4	50.9		47	34.8		-10	14.2		34	40.7		-15	5.6	
23 0	100	47.2	289.9	11	17.1	-4.0	88	45.7	290.0	6	9.9	-4.5	76	50.0	290.0	0	40.0	-4.7	64	47.4	289.8	-4	55.5	-4.6	52	24.3	289.5	-10	18.5	-4.3	39	29.7	289.0	-15	9.3	-3.7
20	105	37.1		11	13.1		93	35.8		6	5.4		81	40.1		0	35.4		69	37.2		-5	0.1		57	13.8		-10	22.8		44	18.7		-15	13.0	
40	110	27.0		11	9.0		98	25.8		6	0.9		86	30.1		0	30.7		74	27.1		-5	4.7		62	3.3		-10	27.1		49	7.6		-15	16.7	

2011 Moon

h m	12 Jun GHA ° ′	d	Dec ° ′	d′	13 Jun GHA ° ′	d	Dec ° ′	d′	14 Jun GHA ° ′	d	Dec ° ′	d′	15 Jun GHA ° ′	d	Dec ° ′	d′	16 Jun GHA ° ′	d	Dec ° ′	d′	17 Jun GHA ° ′	d	Dec ° ′	d′
0 0	53 56.6	289.0	-15 20.4	-3.7	40 23.4	288.4	-19 15.9	-2.8	26 17.7	288.1	-21 59.4	-1.7	11 55.0	288.0	-23 17.6	-0.4	357 39.3	288.3	-23 6.2	0.8	343 54.3	288.9	-21 31.1	1.9
20	58 45.6		-15 24.1		45 11.9		-19 18.7		31 5.7		-22 1.1		16 43.0		-23 18.1		2 27.5		-23 5.5		348 43.1		-21 29.2	
40	63 34.5		-15 27.8		50 0.3		-19 21.5		35 53.8		-22 2.8		21 31.0		-23 18.5		7 15.8		-23 4.7		353 32.0		-21 27.4	
1 0	68 23.5	288.9	-15 31.4	-3.6	54 48.8	288.4	-19 24.3	-2.8	40 41.9	288.1	-22 4.5	-1.6	26 19.0	288.0	-23 18.9	-0.4	12 4.1	288.3	-23 3.9	0.8	358 20.9	288.9	-21 25.5	1.9
20	73 12.4		-15 35.1		59 37.2		-19 27.1		45 30.0		-22 6.1		31 7.1		-23 19.3		16 52.4		-23 3.0		3 9.7		-21 23.6	
40	78 1.4		-15 38.7		64 25.6		-19 29.8		50 18.1		-22 7.7		35 55.1		-23 19.7		21 40.7		-23 2.2		7 58.6		-21 21.7	
2 0	82 50.3	288.9	-15 42.3	-3.6	69 14.1	288.4	-19 32.6	-2.7	55 6.1	288.1	-22 9.3	-1.6	40 43.1	288.0	-23 20.1	-0.3	26 29.0	288.3	-23 1.4	0.9	12 47.5	288.9	-21 19.8	2.0
20	87 39.2		-15 46.0		74 2.5		-19 35.3		59 54.2		-22 10.9		45 31.1		-23 20.4		31 17.4		-23 0.5		17 36.4		-21 17.8	
40	92 28.1		-15 49.6		78 50.9		-19 38.0		64 42.3		-22 12.5		50 19.1		-23 20.8		36 5.7		-22 59.6		22 25.3		-21 15.9	
3 0	97 17.0	288.9	-15 53.2	-3.6	83 39.3	288.4	-19 40.7	-2.6	69 30.3	288.1	-22 14.1	-1.5	55 7.1	288.0	-23 21.1	-0.3	40 54.0	288.3	-22 58.7	0.9	27 14.3	288.9	-21 13.9	2.0
20	102 5.9		-15 56.8		88 27.7		-19 43.3		74 18.4		-22 15.6		59 55.2		-23 21.4		45 42.4		-22 57.8		32 3.2		-21 11.9	
40	106 54.8		-16 0.3		93 16.1		-19 46.0		79 6.4		-22 17.1		64 43.2		-23 21.6		50 30.7		-22 56.8		36 52.1		-21 9.9	
4 0	111 43.7	288.9	-16 3.9	-3.5	98 4.4	288.4	-19 48.6	-2.6	83 54.5	288.0	-22 18.6	-1.5	69 31.2	288.0	-23 21.9	-0.2	55 19.1	288.4	-22 55.9	1.0	41 41.1	289.0	-21 7.9	2.0
20	116 32.5		-16 7.5		102 52.8		-19 51.3		88 42.5		-22 20.1		74 19.3		-23 22.2		60 7.4		-22 54.9		46 30.1		-21 5.9	
40	121 21.4		-16 11.0		107 41.2		-19 53.9		93 30.6		-22 21.6		79 7.3		-23 22.4		64 55.8		-22 54.0		51 19.0		-21 3.9	
5 0	126 10.3	288.8	-16 14.5	-3.5	112 29.6	288.4	-19 56.5	-2.6	98 18.6	288.0	-22 23.0	-1.4	83 55.3	288.0	-23 22.6	-0.2	69 44.2	288.4	-22 53.0	1.0	56 8.0	289.0	-21 1.9	2.1
20	130 59.1		-16 18.1		117 17.9		-19 59.1		103 6.7		-22 24.5		88 43.3		-23 22.8		74 32.5		-22 51.9		60 57.0		-20 59.8	
40	135 48.0		-16 21.6		122 6.3		-20 1.7		107 54.7		-22 25.9		93 31.4		-23 23.0		79 20.9		-22 50.9		65 46.0		-20 57.8	
6 0	140 36.8	288.8	-16 25.1	-3.5	126 54.6	288.3	-20 4.2	-2.5	112 42.7	288.0	-22 27.3	-1.4	98 19.4	288.0	-23 23.1	-0.1	84 9.3	288.4	-22 49.9	1.1	70 35.0	289.0	-20 55.7	2.1
20	145 25.6		-16 28.6		131 43.0		-20 6.8		117 30.8		-22 28.7		103 7.5		-23 23.3		88 57.7		-22 48.8		75 24.0		-20 53.6	
40	150 14.5		-16 32.0		136 31.3		-20 9.3		122 18.8		-22 30.1		107 55.5		-23 23.4		93 46.1		-22 47.7		80 13.1		-20 51.5	
7 0	155 3.3	288.8	-16 35.5	-3.4	141 19.6	288.3	-20 11.8	-2.5	127 6.8	288.0	-22 31.4	-1.3	112 43.6	288.1	-23 23.5	-0.1	98 34.5	288.4	-22 46.6	1.1	85 2.1	289.1	-20 49.4	2.2
20	159 52.1		-16 39.0		146 7.9		-20 14.3		131 54.9		-22 32.8		117 31.6		-23 23.6		103 23.0		-22 45.5		89 51.1		-20 47.2	
40	164 40.9		-16 42.4		150 56.3		-20 16.8		136 42.9		-22 34.1		122 19.7		-23 23.6		108 11.4		-22 44.4		94 40.2		-20 45.1	
8 0	169 29.7	288.8	-16 45.8	-3.4	155 44.6	288.3	-20 19.3	-2.4	141 30.9	288.0	-22 35.4	-1.3	127 7.7	288.1	-23 23.7	0.0	112 59.8	288.5	-22 43.3	1.2	99 29.3	289.1	-20 42.9	2.2
20	174 18.5		-16 49.3		160 32.9		-20 21.7		146 18.9		-22 36.7		131 55.8		-23 23.7		117 48.3		-22 42.1		104 18.3		-20 40.8	
40	179 7.2		-16 52.7		165 21.2		-20 24.1		151 7.0		-22 37.9		136 43.9		-23 23.7		122 36.7		-22 41.0		109 7.4		-20 38.6	
9 0	183 56.0	288.8	-16 56.1	-3.4	170 9.5	288.3	-20 26.6	-2.4	155 55.0	288.0	-22 39.2	-1.2	141 31.9	288.1	-23 23.7	0.0	127 25.2	288.5	-22 39.8	1.2	113 56.5	289.1	-20 36.4	2.2
20	188 44.8		-16 59.4		174 57.8		-20 29.0		160 43.0		-22 40.4		146 20.0		-23 23.7		132 13.7		-22 38.6		118 45.6		-20 34.2	
40	193 33.5		-17 2.8		179 46.1		-20 31.4		165 31.0		-22 41.7		151 8.1		-23 23.7		137 2.1		-22 37.3		123 34.8		-20 32.0	
10 0	198 22.3	288.7	-17 6.2	-3.3	184 34.3	288.3	-20 33.7	-2.4	170 19.0	288.0	-22 42.9	-1.2	155 56.1	288.1	-23 23.6	0.1	141 50.6	288.5	-22 36.1	1.3	128 23.9	289.1	-20 29.8	2.3
20	203 11.0		-17 9.5		189 22.6		-20 36.1		175 7.0		-22 44.0		160 44.2		-23 23.6		146 39.1		-22 34.9		133 13.0		-20 27.5	
40	207 59.8		-17 12.9		194 10.9		-20 38.5		179 55.0		-22 45.2		165 32.3		-23 23.5		151 27.6		-22 33.6		138 2.2		-20 25.3	
11 0	212 48.5	288.7	-17 16.2	-3.3	198 59.1	288.3	-20 40.8	-2.3	184 43.1	288.0	-22 46.4	-1.1	170 20.4	288.1	-23 23.4	0.1	156 16.1	288.5	-22 32.3	1.3	142 51.3	289.2	-20 23.0	2.3
20	217 37.2		-17 19.5		203 47.4		-20 43.1		189 31.1		-22 47.5		175 8.5		-23 23.3		161 4.6		-22 31.0		147 40.5		-20 20.7	
40	222 25.9		-17 22.8		208 35.6		-20 45.4		194 19.1		-22 48.6		179 56.6		-23 23.1		165 53.1		-22 29.7		152 29.7		-20 18.4	
12 0	227 14.6	288.7	-17 26.1	-3.3	213 23.9	288.2	-20 47.7	-2.3	199 7.1	288.0	-22 49.7	-1.1	184 44.7	288.1	-23 23.0	0.2	170 41.7	288.5	-22 28.4	1.3	157 18.9	289.2	-20 16.1	2.3
20	232 3.3		-17 29.4		218 12.1		-20 50.0		203 55.1		-22 50.8		189 32.8		-23 22.8		175 30.2		-22 27.1		162 8.1		-20 13.8	
40	236 52.0		-17 32.6		223 0.4		-20 52.2		208 43.1		-22 51.8		194 20.9		-23 22.6		180 18.7		-22 25.7		166 57.3		-20 11.5	
13 0	241 40.7	288.7	-17 35.9	-3.2	227 48.6	288.2	-20 54.5	-2.2	213 31.1	288.0	-22 52.9	-1.0	199 9.0	288.1	-23 22.4	0.2	185 7.3	288.6	-22 24.4	1.4	171 46.5	289.2	-20 9.2	2.4
20	246 29.4		-17 39.1		232 36.8		-20 56.7		218 19.1		-22 53.9		203 57.1		-23 22.2		189 55.9		-22 23.0		176 35.7		-20 6.8	
40	251 18.1		-17 42.4		237 25.0		-20 58.9		223 7.1		-22 54.9		208 45.2		-23 22.0		194 44.4		-22 21.6		181 25.0		-20 4.5	
14 0	256 6.7	288.6	-17 45.6	-3.2	242 13.3	288.2	-21 1.1	-2.2	227 55.1	288.0	-22 55.9	-1.0	213 33.4	288.1	-23 21.7	0.3	199 33.0	288.6	-22 20.2	1.5	186 14.2	289.3	-20 2.1	2.4
20	260 55.4		-17 48.8		247 1.5		-21 3.3		232 43.1		-22 56.9		218 21.5		-23 21.4		204 21.6		-22 18.7		191 3.5		-19 59.7	
40	265 44.0		-17 52.0		251 49.7		-21 5.4		237 31.1		-22 57.8		223 9.6		-23 21.1		209 10.2		-22 17.3		195 52.7		-19 57.3	
15 0	270 32.7	288.6	-17 55.1	-3.2	256 37.9	288.2	-21 7.6	-2.1	242 19.1	288.0	-22 58.8	-0.9	227 57.7	288.1	-23 20.8	0.3	213 58.8	288.6	-22 15.8	1.5	200 42.0	289.3	-19 54.9	2.4
20	275 21.3		-17 58.3		261 26.1		-21 9.7		247 7.1		-22 59.7		232 45.9		-23 20.5		218 47.4		-22 14.4		205 31.3		-19 52.5	
40	280 9.9		-18 1.4		266 14.3		-21 11.8		251 55.1		-23 0.6		237 34.0		-23 20.2		223 36.0		-22 12.9		210 20.6		-19 50.1	
16 0	284 58.6	288.6	-18 4.6	-3.1	271 2.5	288.2	-21 13.9	-2.1	256 43.1	288.0	-23 1.5	-0.9	242 22.2	288.2	-23 19.8	0.4	228 24.6	288.6	-22 11.4	1.5	215 9.9	289.3	-19 47.6	2.5
20	289 47.2		-18 7.7		275 50.6		-21 16.0		261 31.1		-23 2.4		247 10.3		-23 19.4		233 13.3		-22 9.9		219 59.2		-19 45.2	
40	294 35.8		-18 10.8		280 38.8		-21 18.1		266 19.1		-23 3.2		251 58.5		-23 19.1		238 1.9		-22 8.3		224 48.6		-19 42.7	
17 0	299 24.4	288.6	-18 13.9	-3.1	285 27.0	288.2	-21 20.1	-2.0	271 7.0	288.0	-23 4.1	-0.8	256 46.6	288.2	-23 18.6	0.4	242 50.6	288.7	-22 6.8	1.6	229 37.9	289.4	-19 40.2	2.5
20	304 13.0		-18 17.0		290 15.2		-21 22.1		275 55.0		-23 4.9		261 34.8		-23 18.2		247 39.2		-22 5.2		234 27.3		-19 37.7	
40	309 1.6		-18 20.1		295 3.3		-21 24.2		280 43.0		-23 5.7		266 23.0		-23 17.8		252 27.9		-22 3.7		239 16.6		-19 35.2	
18 0	313 50.2	288.6	-18 23.1	-3.0	299 51.5	288.2	-21 26.2	-2.0	285 31.0	288.0	-23 6.5	-0.7	271 11.2	288.2	-23 17.3	0.5	257 16.6	288.7	-22 2.1	1.6	244 6.0	289.4	-19 32.7	2.5
20	318 38.7		-18 26.2		304 39.6		-21 28.2		290 19.0		-23 7.2		275 59.3		-23 16.8		262 5.3		-22 0.5		248 55.4		-19 30.2	
40	323 27.3		-18 29.2		309 27.8		-21 30.1		295 7.0		-23 8.0		280 47.5		-23 16.4		266 54.0		-21 58.9		253 44.8		-19 27.7	
19 0	328 15.8	288.5	-18 32.2	-3.0	314 15.9	288.1	-21 32.1	-1.9	299 55.0	288.0	-23 8.7	-0.7	285 35.7	288.2	-23 15.8	0.5	271 42.7	288.7	-21 57.2	1.7	258 34.2	289.4	-19 25.1	2.5
20	333 4.4		-18 35.3		319 4.1		-21 34.0		304 43.0		-23 9.4		290 23.9		-23 15.3		276 31.4		-21 55.6		263 23.6		-19 22.6	
40	337 52.9		-18 38.3		323 52.2		-21 35.9		309 31.0		-23 10.1		295 12.1		-23 14.8		281 20.1		-21 53.9		268 13.0		-19 20.0	
20 0	342 41.5	288.5	-18 41.2	-3.0	328 40.3	288.1	-21 37.8	-1.9	314 19.0	288.0	-23 10.8	-0.7	300 0.3	288.2	-23 14.2	0.6	286 8.8	288.7	-21 52.2	1.7	273 2.4	289.5	-19 17.5	2.6
20	347 30.0		-18 44.2		333 28.5		-21 39.7		319 7.0		-23 11.5		304 48.5		-23 13.6		290 57.6		-21 50.6		277 51.9		-19 14.9	
40	352 18.5		-18 47.2		338 16.6		-21 41.6		323 55.0		-23 12.1		309 36.8		-23 13.1		295 46.3		-21 48.9		282 41.3		-19 12.3	
21 0	357 7.1	288.5	-18 50.1	-2.9	343 4.7	288.1	-21 43.5	-1.8	328 43.0	288.0	-23 12.8	-0.6	314 25.0	288.2	-23 12.4	0.6	300 35.1	288.8	-21 47.1	1.7	287 30.8	289.5	-19 9.7	2.6
20	1 55.6		-18 53.0		347 52.8		-21 45.3		333 31.0		-23 13.4		319 13.2		-23 11.8		305 23.8		-21 45.4		292 20.2		-19 7.1	
40	6 44.1		-18 55.9		352 41.0		-21 47.1		338 19.0		-23 14.0		324 1.4		-23 11.2		310 12.6		-21 43.7		297 9.7		-19 4.4	
22 0	11 32.6	288.5	-18 58.8	-2.9	357 29.1	288.1	-21 48.9	-1.8	343 7.0	288.0	-23 14.5	-0.6	328 49.7	288.3	-23 10.5	0.7	315 1.4	288.8	-21 41.9	1.8	301 59.2	289.5	-19 1.8	2.7
20	16 21.1		-19 1.7		2 17.2		-21 50.7		347 55.0		-23 15.1		333 37.9		-23 9.9		319 50.2		-21 40.1		306 48.7		-18 59.1	
40	21 9.6		-19 4.6		7 5.3		-21 52.5		352 43.0		-23 15.6		338 26.2		-23 9.2		324 39.0		-21 38.4		311 38.2		-18 56.5	
23 0	25 58.0	288.5	-19 7.5	-2.8	11 53.4	288.1	-21 54.3	-1.7	357 31.0	288.0	-23 16.2	-0.5	343 14.4	288.3	-23 8.5	0.8	329 27.8	288.8	-21 36.6	1.8	316 27.8	289.5	-18 53.8	2.7
20	30 46.5		-19 10.3		16 41.5		-21 56.0		2 19.0		-23 16.7		348 2.7		-23 7.7		334 16.6		-21 34.7		321 17.3		-18 51.1	
40	35 35.0		-19 13.1		21 29.6		-21 57.7		7 7.0		-23 17.1		352 51.0		-23 7.0		339 5.5		-21 32.9		326 6.8		-18 48.4	

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h m	18 Jun GHA ° ′	d	Dec ° ′	d ′	19 Jun GHA ° ′	d	Dec ° ′	d ′	20 Jun GHA ° ′	d	Dec ° ′	d ′	21 Jun GHA ° ′	d	Dec ° ′	d ′	22 Jun GHA ° ′	d	Dec ° ′	d ′	23 Jun GHA ° ′	d	Dec ° ′	d ′
0 0	330 56.4	289.6	-18 45.7	2.7	318 51.0	290.3	-15 7.5	3.3	307 34.1	290.9	-10 53.2	3.7	296 56.0	291.4	-6 17.8	3.9	286 43.9	291.6	-1 33.1	4.0	276 44.6	291.7	3 10.9	3.9
20	335 46.0		-18 43.0		323 41.3		-15 4.1		312 25.0		-10 49.5		301 47.3		-6 13.8		291 35.6		-1 29.1		281 36.3		3 14.8	
40	340 35.5		-18 40.3		328 31.6		-15 0.8		317 15.9		-10 45.8		306 38.7		-6 9.9		296 27.2		-1 25.2		286 28.0		3 18.7	
1 0	345 25.1	289.6	-18 37.6	2.8	333 21.9	290.3	-14 57.5	3.4	322 6.8	290.9	-10 42.1	3.7	311 30.0	291.4	-6 6.0	3.9	301 18.8	291.6	-1 21.2	4.0	291 19.7	291.7	3 22.6	3.9
20	350 14.7		-18 34.8		338 12.2		-14 54.1		326 57.7		-10 38.3		316 21.4		-6 2.1		306 10.4		-1 17.2		296 11.4		3 26.5	
40	355 4.3		-18 32.1		343 2.5		-14 50.8		331 48.7		-10 34.6		321 12.8		-5 58.2		311 2.1		-1 13.3		301 3.1		3 30.4	
2 0	359 53.9	289.6	-18 29.3	2.8	347 52.8	290.3	-14 47.4	3.4	336 39.6	291.0	-10 30.9	3.7	326 4.1	291.4	-5 54.2	3.9	315 53.7	291.6	-1 9.3	4.0	305 54.8	291.7	3 34.3	3.9
20	4 43.6		-18 26.6		352 43.2		-14 44.1		341 30.6		-10 27.2		330 55.5		-5 50.3		320 45.3		-1 5.3		310 46.5		3 38.2	
40	9 33.2		-18 23.8		357 33.5		-14 40.7		346 21.5		-10 23.4		335 46.9		-5 46.4		325 37.0		-1 1.4		315 38.2		3 42.1	
3 0	14 22.9	289.7	-18 21.0	2.8	2 23.9	290.4	-14 37.3	3.4	351 12.5	291.0	-10 19.7	3.8	340 38.3	291.4	-5 42.5	3.9	330 28.6	291.6	-0 57.4	4.0	320 29.9	291.7	3 46.0	3.9
20	19 12.5		-18 18.2		7 14.3		-14 33.9		356 3.4		-10 15.9		345 29.7		-5 38.5		335 20.2		-0 53.4		325 21.6		3 49.8	
40	24 2.2		-18 15.4		12 4.6		-14 30.5		0 54.4		-10 12.2		350 21.1		-5 34.6		340 11.9		-0 49.5		330 13.3		3 53.7	
4 0	28 51.9	289.7	-18 12.6	2.8	16 55.0	290.4	-14 27.1	3.4	5 45.4	291.0	-10 8.4	3.8	355 12.5	291.4	-5 30.7	3.9	345 3.5	291.6	-0 45.5	4.0	335 4.9	291.7	3 57.6	3.9
20	33 41.6		-18 9.7		21 45.4		-14 23.7		10 36.4		-10 4.7		0 3.9		-5 26.7		349 55.2		-0 41.5		339 56.6		4 1.5	
40	38 31.3		-18 6.9		26 35.8		-14 20.3		15 27.4		-10 0.9		4 55.3		-5 22.8		354 46.8		-0 37.6		344 48.3		4 5.3	
5 0	43 21.0	289.7	-18 4.1	2.9	31 26.2	290.4	-14 16.9	3.4	20 18.4	291.0	-9 57.1	3.8	9 46.7	291.4	-5 18.9	3.9	359 38.5	291.7	-0 33.6	4.0	349 40.0	291.7	4 9.2	3.9
20	48 10.7		-18 1.2		36 16.7		-14 13.5		25 9.4		-9 53.4		14 38.2		-5 14.9		4 30.1		-0 29.6		354 31.7		4 13.1	
40	53 0.4		-17 58.3		41 7.1		-14 10.1		30 0.4		-9 49.6		19 29.6		-5 11.0		9 21.8		-0 25.7		359 23.4		4 17.0	
6 0	57 50.1	289.8	-17 55.5	2.9	45 57.5	290.5	-14 6.6	3.4	34 51.4	291.0	-9 45.8	3.8	24 21.0	291.4	-5 7.1	4.0	14 13.4	291.7	-0 21.7	4.0	4 15.1	291.7	4 20.8	3.9
20	62 39.9		-17 52.6		50 48.0		-14 3.2		39 42.4		-9 42.0		29 12.5		-5 3.1		19 5.1		-0 17.7		9 6.8		4 24.7	
40	67 29.7		-17 49.7		55 38.4		-13 59.8		44 33.5		-9 38.3		34 3.9		-4 59.2		23 56.8		-0 13.8		13 58.5		4 28.6	
7 0	72 19.4	289.8	-17 46.8	2.9	60 28.9	290.5	-13 56.3	3.5	49 24.5	291.1	-9 34.5	3.8	38 55.3	291.5	-4 55.2	3.9	28 48.4	291.7	-0 9.8	4.0	18 50.2	291.7	4 32.4	3.9
20	77 9.2		-17 43.9		65 19.4		-13 52.9		54 15.6		-9 30.7		43 46.8		-4 51.3		33 40.1		-0 5.9		23 41.9		4 36.3	
40	81 59.0		-17 40.9		70 9.9		-13 49.4		59 6.6		-9 26.9		48 38.2		-4 47.3		38 31.7		-0 1.9		28 33.6		4 40.1	
8 0	86 48.8	289.8	-17 38.0	3.0	75 0.4	290.5	-13 45.9	3.5	63 57.7	291.1	-9 23.1	3.8	53 29.7	291.5	-4 43.4	4.0	43 23.4	291.7	0 2.1	3.9	33 25.2	291.7	4 44.0	3.8
20	91 38.6		-17 35.1		79 50.9		-13 42.4		68 48.7		-9 19.3		58 21.2		-4 39.4		48 15.1		0 6.0		38 16.9		4 47.8	
40	96 28.4		-17 32.1		84 41.4		-13 39.0		73 39.8		-9 15.5		63 12.6		-4 35.5		53 6.7		0 10.0		43 8.6		4 51.7	
9 0	101 18.3	289.9	-17 29.1	3.0	89 31.9	290.5	-13 35.5	3.5	78 30.9	291.1	-9 11.7	3.8	68 4.1	291.5	-4 31.5	3.9	57 58.4	291.7	0 13.9	4.0	48 0.3	291.7	4 55.5	3.8
20	106 8.1		-17 26.2		94 22.4		-13 32.0		83 22.0		-9 7.9		72 55.6		-4 27.6		62 50.1		0 17.9		52 52.0		4 59.4	
40	110 58.0		-17 23.2		99 13.0		-13 28.5		88 13.1		-9 4.1		77 47.1		-4 23.6		67 41.8		0 21.9		57 43.7		5 3.2	
10 0	115 47.8	289.9	-17 20.2	3.0	104 3.5	290.6	-13 25.0	3.5	93 4.2	291.1	-9 0.3	3.8	82 38.5	291.5	-4 19.7	4.0	72 33.4	291.7	0 25.8	4.0	62 35.3	291.7	5 7.0	3.8
20	120 37.7		-17 17.2		108 54.1		-13 21.5		97 55.3		-8 56.5		87 30.0		-4 15.7		77 25.1		0 29.8		67 27.0		5 10.9	
40	125 27.6		-17 14.2		113 44.6		-13 18.0		102 46.4		-8 52.6		92 21.5		-4 11.8		82 16.8		0 33.7		72 18.7		5 14.7	
11 0	130 17.5	289.9	-17 11.2	3.0	118 35.2	290.6	-13 14.4	3.5	107 37.5	291.1	-8 48.8	3.8	97 13.0	291.5	-4 7.8	4.0	87 8.5	291.7	0 37.7	3.9	77 10.4	291.7	5 18.5	3.8
20	135 7.4		-17 8.2		123 25.8		-13 10.9		112 28.7		-8 45.0		102 4.5		-4 3.9		92 0.1		0 41.6		82 2.1		5 22.4	
40	139 57.3		-17 5.2		128 16.4		-13 7.4		117 19.8		-8 41.2		106 56.0		-3 59.9		96 51.8		0 45.6		86 53.7		5 26.2	
12 0	144 47.2	289.9	-17 2.1	3.0	133 7.0	290.6	-13 3.8	3.5	122 10.9	291.2	-8 37.3	3.8	111 47.5	291.5	-3 55.9	3.9	101 43.5	291.7	0 49.5	4.0	91 45.4	291.7	5 30.0	3.8
20	149 37.1		-16 59.1		137 57.6		-13 0.3		127 2.1		-8 33.5		116 39.0		-3 52.0		106 35.2		0 53.5		96 37.1		5 33.8	
40	154 27.1		-16 56.0		142 48.2		-12 56.8		131 53.2		-8 29.7		121 30.5		-3 48.0		111 26.9		0 57.4		101 28.8		5 37.7	
13 0	159 17.0	290.0	-16 53.0	3.1	147 38.9	290.6	-12 53.2	3.6	136 44.4	291.2	-8 25.8	3.8	126 22.1	291.5	-3 44.1	4.0	116 18.6	291.7	1 1.4	3.9	106 20.4	291.7	5 41.5	3.8
20	164 7.0		-16 49.9		152 29.5		-12 49.6		141 35.6		-8 22.0		131 13.6		-3 40.1		121 10.3		1 5.3		111 12.1		5 45.3	
40	168 57.0		-16 46.8		157 20.1		-12 46.1		146 26.7		-8 18.1		136 5.1		-3 36.1		126 1.9		1 9.3		116 3.8		5 49.1	
14 0	173 46.9	290.0	-16 43.7	3.1	162 10.8	290.7	-12 42.5	3.6	151 17.9	291.2	-8 14.3	3.9	140 56.6	291.5	-3 32.2	4.0	130 53.6	291.7	1 13.2	3.9	120 55.4	291.7	5 52.9	3.8
20	178 36.9		-16 40.6		167 1.4		-12 38.9		156 9.1		-8 10.4		145 48.2		-3 28.2		135 45.3		1 17.2		125 47.1		5 56.7	
40	183 26.9		-16 37.5		171 52.1		-12 35.4		161 0.3		-8 6.6		150 39.7		-3 24.2		140 37.0		1 21.1		130 38.7		6 0.5	
15 0	188 17.0	290.0	-16 34.4	3.1	176 42.8	290.7	-12 31.8	3.6	165 51.5	291.2	-8 2.7	3.9	155 31.2	291.5	-3 20.3	4.0	145 28.7	291.7	1 25.0	4.0	135 30.4	291.7	6 4.3	3.8
20	193 7.0		-16 31.3		181 33.5		-12 28.2		170 42.7		-7 58.9		160 22.8		-3 16.3		150 20.4		1 29.0		140 22.1		6 8.1	
40	197 57.0		-16 28.2		186 24.2		-12 24.6		175 33.9		-7 55.0		165 14.3		-3 12.3		155 12.1		1 32.9		145 13.7		6 11.9	
16 0	202 47.1	290.1	-16 25.0	3.1	191 14.9	290.7	-12 21.0	3.6	180 25.1	291.2	-7 51.1	3.9	170 5.9	291.6	-3 8.4	4.0	160 3.8	291.7	1 36.9	3.9	150 5.4	291.7	6 15.7	3.8
20	207 37.1		-16 21.9		196 5.6		-12 17.4		185 16.3		-7 47.3		174 57.4		-3 4.4		164 55.5		1 40.8		154 57.0		6 19.5	
40	212 27.2		-16 18.7		200 56.3		-12 13.8		190 7.6		-7 43.4		179 49.0		-3 0.4		169 47.2		1 44.7		159 48.7		6 23.3	
17 0	217 17.2	290.1	-16 15.6	3.2	205 47.0	290.7	-12 10.2	3.6	194 58.8	291.2	-7 39.5	3.9	184 40.5	291.6	-2 56.5	4.0	174 38.9	291.7	1 48.7	3.9	164 40.3	291.6	6 27.1	3.8
20	222 7.3		-16 12.4		210 37.8		-12 6.5		199 50.0		-7 35.7		189 32.1		-2 52.5		179 30.6		1 52.6		169 32.0		6 30.8	
40	226 57.4		-16 9.2		215 28.5		-12 2.9		204 41.3		-7 31.8		194 23.7		-2 48.5		184 22.3		1 56.5		174 23.6		6 34.6	
18 0	231 47.5	290.1	-16 6.0	3.2	220 19.2	290.8	-11 59.3	3.6	209 32.5	291.3	-7 27.9	3.9	199 15.2	291.6	-2 44.6	4.0	189 14.0	291.7	2 0.4	3.9	179 15.2	291.6	6 38.4	3.8
20	236 37.6		-16 2.8		225 10.0		-11 55.7		214 23.8		-7 24.0		204 6.8		-2 40.6		194 5.7		2 4.4		184 6.9		6 42.2	
40	241 27.7		-15 59.6		230 0.8		-11 52.0		219 15.0		-7 20.2		208 58.4		-2 36.6		198 57.4		2 8.3		188 58.5		6 45.9	
19 0	246 17.9	290.1	-15 56.4	3.2	234 51.5	290.8	-11 48.4	3.7	224 6.3	291.3	-7 16.3	3.9	213 49.9	291.6	-2 32.7	4.0	203 49.1	291.7	2 12.2	3.9	193 50.2	291.6	6 49.7	3.8
20	251 8.0		-15 53.2		239 42.3		-11 44.7		228 57.6		-7 12.4		218 41.5		-2 28.7		208 40.8		2 16.2		198 41.8		6 53.5	
40	255 58.2		-15 50.0		244 33.1		-11 41.1		233 48.9		-7 8.5		223 33.1		-2 24.7		213 32.5		2 20.1		203 33.4		6 57.2	
20 0	260 48.3	290.2	-15 46.8	3.3	249 23.9	290.8	-11 37.4	3.7	238 40.1	291.3	-7 4.6	3.9	228 24.7	291.6	-2 20.8	4.0	218 24.2	291.7	2 24.0	3.9	208 25.1	291.6	7 1.0	3.7
20	265 38.5		-15 43.5		254 14.7		-11 33.8		243 31.4		-7 0.7		233 16.3		-2 16.8		223 15.9		2 27.9		213 16.7		7 4.7	
40	270 28.7		-15 40.3		259 5.5		-11 30.1		248 22.7		-6 56.8		238 7.9		-2 12.8		228 7.6		2 31.8		218 8.3		7 8.5	
21 0	275 18.9	290.2	-15 37.0	3.3	263 56.4	290.8	-11 26.4	3.7	253 14.0	291.3	-6 52.9	3.9	242 59.5	291.6	-2 8.8	4.0	232 59.3	291.7	2 35.7	3.9	222 59.9	291.6	7 12.2	3.8
20	280 9.1		-15 33.8		268 47.2		-11 22.8		258 5.3		-6 49.0		247 51.1		-2 4.9		237 51.0		2 39.7		227 51.6		7 16.0	
40	284 59.3		-15 30.5		273 38.0		-11 19.1		262 56.6		-6 45.1		252 42.7		-2 0.9		242 42.7		2 43.6		232 43.2		7 19.7	
22 0	289 49.5	290.2	-15 27.2	3.3	278 28.9	290.9	-11 15.4	3.7	267 48.0	291.3	-6 41.2	3.9	257 34.3	291.6	-1 56.9	4.0	247 34.4	291.7	2 47.5	3.9	237 34.8	291.6	7 23.5	3.7
20	294 39.7		-15 24.0		283 19.7		-11 11.7		272 39.3		-6 37.3		262 25.9		-1 53.0		252 26.1		2 51.4		242 26.4		7 27.2	
40	299 29.9		-15 20.7		288 10.6		-11 8.0		277 30.6		-6 33.4		267 17.5		-1 49.0		257 17.8		2 55.3		247 18.0		7 30.9	
23 0	304 20.2	290.3	-15 17.4	3.3	293 1.5	290.9	-11 4.3	3.7	282 21.9	291.3	-6 29.5	3.9	272 9.1	291.6	-1 45.0	4.0	262 9.5	291.7	2 59.2	3.9	252 9.6	291.6	7 34.7	3.7
20	309 10.5		-15 14.1		297 52.3		-11 0.6		287 13.3		-6 25.6		277 0.7		-1 41.1		267 1.2		3 3.1		257 1.2		7 38.4	
40	314 0.7		-15 10.8		302 43.2		-10 56.9		292 4.6		-6 21.7		281 52.3		-1 37.1		271 52.9		3 7.0		261 52.8		7 42.1	

2011 Moon

	24 Jun						25 Jun						26 Jun						27 Jun						28 Jun						29 Jun					
	GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec		
h m	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'
0 0	266	44.4	291.6	7	45.8	3.7	256	30.8	291.3	12	3.3	3.4	245	52.2	290.9	15	54.5	3.0	234	39.6	290.4	19	9.2	2.4	222	48.0	289.8	21	36.2	1.6	210	18.5	289.3	23	3.6	0.7
20	271	36.0		7	49.5		261	22.1		12	6.7		250	43.1		15	57.5		239	30.0		19	11.6		227	37.8		21	37.8		215	7.8		23	4.4	
40	276	27.6		7	53.2		266	13.4		12	10.1		255	34.0		16	0.4		244	20.4		19	14.0		232	27.7		21	39.5		219	57.2		23	5.1	
1 0	281	19.2	291.6	7	57.0	3.7	271	4.8	291.3	12	13.5	3.4	260	24.9	290.9	16	3.4	2.9	249	10.7	290.4	19	16.4	2.4	237	17.5	289.8	21	41.1	1.6	224	46.5	289.3	23	5.8	0.7
20	286	10.8		8	0.7		275	56.1		12	16.9		265	15.8		16	6.4		254	1.1		19	18.7		242	7.3		21	42.7		229	35.9		23	6.5	
40	291	2.4		8	4.4		280	47.4		12	20.3		270	6.7		16	9.3		258	51.5		19	21.1		246	57.1		21	44.3		234	25.2		23	7.2	
2 0	295	54.0	291.6	8	8.1	3.7	285	38.7	291.3	12	23.7	3.4	274	57.6	290.9	16	12.2	2.9	263	41.8	290.3	19	23.5	2.3	251	46.9	289.8	21	45.9	1.6	239	14.5	289.3	23	7.9	0.6
20	300	45.6		8	11.8		290	30.0		12	27.1		279	48.4		16	15.2		268	32.2		19	25.8		256	36.7		21	47.5		244	3.8		23	8.5	
40	305	37.1		8	15.4		295	21.3		12	30.5		284	39.3		16	18.1		273	22.5		19	28.1		261	26.5		21	49.0		248	53.2		23	9.2	
3 0	310	28.7	291.6	8	19.1	3.7	300	12.6	291.3	12	33.8	3.4	289	30.1	290.8	16	21.0	2.9	278	12.8	290.3	19	30.4	2.3	266	16.3	289.8	21	50.6	1.5	253	42.5	289.3	23	9.8	0.6
20	315	20.3		8	22.8		305	3.8		12	37.2		294	21.0		16	23.9		283	3.1		19	32.8		271	6.1		21	52.1		258	31.8		23	10.4	
40	320	11.9		8	26.5		309	55.1		12	40.6		299	11.8		16	26.9		287	53.5		19	35.1		275	55.8		21	53.7		263	21.1		23	11.0	
4 0	325	3.4	291.6	8	30.2	3.7	314	46.4	291.3	12	43.9	3.4	304	2.7	290.8	16	29.8	2.9	292	43.8	290.3	19	37.3	2.3	280	45.6	289.7	21	55.2	1.5	268	10.4	289.3	23	11.6	0.6
20	329	55.0		8	33.8		319	37.6		12	47.3		308	53.5		16	32.7		297	34.1		19	39.6		285	35.3		21	56.7		272	59.6		23	12.2	
40	334	46.6		8	37.5		324	28.9		12	50.6		313	44.3		16	35.5		302	24.4		19	41.9		290	25.1		21	58.2		277	48.9		23	12.8	
5 0	339	38.1	291.6	8	41.2	3.7	329	20.2	291.2	12	54.0	3.3	318	35.1	290.8	16	38.4	2.9	307	14.6	290.3	19	44.2	2.2	295	14.8	289.7	21	59.7	1.5	282	38.2	289.3	23	13.3	0.5
20	344	29.7		8	44.8		334	11.4		12	57.3		323	25.9		16	41.3		312	4.9		19	46.4		300	4.6		22	1.1		287	27.5		23	13.9	
40	349	21.2		8	48.5		339	2.7		13	0.6		328	16.7		16	44.1		316	55.2		19	48.7		304	54.3		22	2.6		292	16.7		23	14.4	
6 0	354	12.8	291.5	8	52.2	3.6	343	53.9	291.2	13	3.9	3.3	333	7.5	290.8	16	47.0	2.8	321	45.4	290.2	19	50.9	2.2	309	44.0	289.7	22	4.1	1.4	297	6.0	289.3	23	14.9	0.5
20	359	4.3		8	55.8		348	45.1		13	7.3		337	58.3		16	49.9		326	35.7		19	53.1		314	33.7		22	5.5		301	55.3		23	15.4	
40	3	55.9		8	59.5		353	36.4		13	10.6		342	49.1		16	52.7		331	25.9		19	55.3		319	23.4		22	6.9		306	44.5		23	15.9	
7 0	8	47.4	291.5	9	3.1	3.6	358	27.6	291.2	13	13.9	3.3	347	39.9	290.8	16	55.5	2.8	336	16.2	290.2	19	57.5	2.2	324	13.1	289.7	22	8.3	1.4	311	33.7	289.2	23	16.3	0.5
20	13	38.9		9	6.7		3	18.8		13	17.2		352	30.6		16	58.4		341	6.4		19	59.7		329	2.8		22	9.7		316	23.0		23	16.8	
40	18	30.5		9	10.4		8	10.0		13	20.5		357	21.4		17	1.2		345	56.6		20	1.9		333	52.5		22	11.1		321	12.2		23	17.2	
8 0	23	22.0	291.5	9	14.0	3.6	13	1.2	291.2	13	23.8	3.3	2	12.1	290.7	17	4.0	2.8	350	46.8	290.2	20	4.1	2.2	338	42.1	289.7	22	12.5	1.3	326	1.4	289.2	23	17.7	0.4
20	28	13.5		9	17.6		17	52.4		13	27.0		7	2.9		17	6.8		355	37.0		20	6.3		343	31.8		22	13.9		330	50.7		23	18.1	
40	33	5.0		9	21.3		22	43.6		13	30.3		11	53.6		17	9.6		0	27.2		20	8.4		348	21.4		22	15.2		335	39.9		23	18.5	
9 0	37	56.6	291.5	9	24.9	3.6	27	34.8	291.2	13	33.6	3.3	16	44.3	290.7	17	12.4	2.8	5	17.4	290.2	20	10.6	2.1	353	11.1	289.6	22	16.5	1.3	340	29.1	289.2	23	18.9	0.3
20	42	48.1		9	28.5		32	26.0		13	36.9		21	35.1		17	15.1		10	7.6		20	12.7		358	0.7		22	17.9		345	18.3		23	19.2	
40	47	39.6		9	32.1		37	17.2		13	40.1		26	25.8		17	17.9		14	57.8		20	14.8		2	50.4		22	19.2		350	7.5		23	19.6	
10 0	52	31.1	291.5	9	35.7	3.6	42	8.3	291.2	13	43.4	3.2	31	16.5	290.7	17	20.7	2.7	19	47.9	290.2	20	16.9	2.1	7	40.0	289.6	22	20.5	1.3	354	56.7	289.2	23	19.9	0.3
20	57	22.6		9	39.3		46	59.5		13	46.6		36	7.2		17	23.4		24	38.1		20	19.0		12	29.6		22	21.8		359	45.9		23	20.3	
40	62	14.1		9	42.9		51	50.7		13	49.9		40	57.9		17	26.2		29	28.2		20	21.1		17	19.2		22	23.1		4	35.1		23	20.6	
11 0	67	5.6	291.5	9	46.5	3.6	56	41.8	291.1	13	53.1	3.2	45	48.6	290.7	17	28.9	2.7	34	18.4	290.1	20	23.2	2.1	22	8.9	289.6	22	24.3	1.2	9	24.3	289.2	23	20.9	0.3
20	71	57.1		9	50.1		61	33.0		13	56.3		50	39.2		17	31.6		39	8.5		20	25.3		26	58.5		22	25.6		14	13.5		23	21.2	
40	76	48.6		9	53.7		66	24.1		13	59.6		55	29.9		17	34.4		43	58.7		20	27.4		31	48.1		22	26.8		19	2.6		23	21.4	
12 0	81	40.1	291.5	9	57.3	3.6	71	15.3	291.1	14	2.8	3.2	60	20.6	290.7	17	37.1	2.7	48	48.8	290.1	20	29.4	2.0	36	37.6	289.6	22	28.0	1.2	23	51.8	289.2	23	21.7	0.2
20	86	31.5		10	0.9		76	6.4		14	6.0		65	11.2		17	39.8		53	38.9		20	31.5		41	27.2		22	29.3		28	41.0		23	21.9	
40	91	23.0		10	4.4		80	57.5		14	9.2		70	1.9		17	42.5		58	29.0		20	33.5		46	16.8		22	30.5		33	30.1		23	22.1	
13 0	96	14.5	291.5	10	8.0	3.6	85	48.6	291.1	14	12.4	3.2	74	52.5	290.6	17	45.2	2.7	63	19.1	290.1	20	35.5	2.0	51	6.4	289.6	22	31.6	1.2	38	19.3	289.1	23	22.4	0.2
20	101	6.0		10	11.6		90	39.8		14	15.6		79	43.2		17	47.9		68	9.2		20	37.5		55	55.9		22	32.8		43	8.5		23	22.6	
40	105	57.4		10	15.1		95	30.9		14	18.8		84	33.8		17	50.5		72	59.3		20	39.5		60	45.5		22	34.0		47	57.6		23	22.7	
14 0	110	48.9	291.5	10	18.7	3.5	100	22.0	291.1	14	22.0	3.2	89	24.4	290.6	17	53.2	2.7	77	49.3	290.1	20	41.5	2.0	65	35.0	289.5	22	35.1	1.1	52	46.8	289.1	23	22.9	0.1
20	115	40.4		10	22.2		105	13.1		14	25.1		94	15.0		17	55.9		82	39.4		20	43.5		70	24.6		22	36.3		57	35.9		23	23.1	
40	120	31.8		10	25.8		110	4.2		14	28.3		99	5.6		17	58.5		87	29.5		20	45.5		75	14.1		22	37.4		62	25.0		23	23.2	
15 0	125	23.3	291.4	10	29.3	3.5	114	55.2	291.1	14	31.5	3.1	103	56.2	290.6	18	1.2	2.6	92	19.5	290.0	20	47.4	1.9	80	3.6	289.5	22	38.5	1.1	67	14.2	289.1	23	23.3	0.1
20	130	14.7		10	32.9		119	46.3		14	34.6		108	46.8		18	3.8		97	9.6		20	49.4		84	53.2		22	39.6		72	3.3		23	23.4	
40	135	6.1		10	36.4		124	37.4		14	37.8		113	37.4		18	6.4		101	59.6		20	51.3		89	42.7		22	40.7		76	52.4		23	23.5	
16 0	139	57.6	291.4	10	39.9	3.5	129	28.5	291.1	14	40.9	3.1	118	28.0	290.6	18	9.0	2.6	106	49.6	290.0	20	53.2	1.9	94	32.2	289.5	22	41.8	1.0	81	41.5	289.1	23	23.6	0.1
20	144	49.0		10	43.5		134	19.5		14	44.1		123	18.6		18	11.6		111	39.6		20	55.1		99	21.7		22	42.8		86	30.7		23	23.7	
40	149	40.4		10	47.0		139	10.6		14	47.2		128	9.1		18	14.2		116	29.6		20	57.0		104	11.2		22	43.9		91	19.8		23	23.8	
17 0	154	31.9	291.4	10	50.5	3.5	144	1.6	291.0	14	50.3	3.1	132	59.7	290.5	18	16.8	2.6	121	19.7	290.0	20	58.9	1.9	109	0.7	289.5	22	44.9	1.0	96	8.9	289.1	23	23.8	0.0
20	159	23.3		10	54.0		148	52.7		14	53.5		137	50.2		18	19.4		126	9.7		21	0.8		113	50.2		22	45.9		100	58.0		23	23.8	
40	164	14.7		10	57.5		153	43.7		14	56.6		142	40.8		18	22.0		130	59.6		21	2.7		118	39.6		22	46.9		105	47.1		23	23.8	
18 0	169	6.1	291.4	11	1.0	3.5	158	34.7	291.0	14	59.7	3.1	147	31.3	290.5	18	24.6	2.5	135	49.6	290.0	21	4.6	1.8	123	29.1	289.5	22	47.9	1.0	110	36.2	289.1	23	23.8	0.0
20	173	57.5		11	4.5		163	25.8		15	2.8		152	21.8		18	27.1		140	39.6		21	6.4		128	18.6		22	48.9		115	25.3		23	23.8	
40	178	48.9		11	8.0		168	16.8		15	5.9		157	12.3		18	29.7		145	29.6		21	8.3		133	8.0		22	49.9		120	14.4		23	23.8	
19 0	183	40.3	291.4	11	11.5	3.5	173	7.8	291.0	15	9.0	3.1	162	2.9	290.5	18	32.2	2.5	150	19.5	289.9	21	10.1	1.8	137	57.5	289.4	22	50.9	0.9	125	3.4	289.1	23	23.7	-0.1
20	188	31.7		11	15.0		177	58.8		15	12.0		166	53.4		18	34.7		155	9.5		21	11.9		142	46.9		22	51.8		129	52.5		23	23.7	
40	193	23.1		11	18.5		182	49.8		15	15.1		171	43.9		18	37.2		159	59.4		21	13.7		147	36.4		22	52.7		134	41.6		23	23.6	
20 0	198	14.5	291.4	11	22.0	3.5	187	40.8	291.0	15	18.2	3.1	176	34.3	290.5	18	39.8	2.5	164	49.4	289.9	21	15.5	1.8	152	25.8	289.4	22	53.6	0.9	139	30.7	289.1	23	23.5	-0.1
20	203	5.9		11	25.4		192	31.8		15	21.3		181	24.8		18	42.3		169	39.3		21	17.3		157	15.2		22	54.5		144	19.7		23	23.4	
40	207	57.3		11	28.9		197	22.8		15	24.3		186	15.3		18	44.8		174	29.2		21	19.1		162	4.6		22	55.4		149	8.8		23	23.3	
21 0	212	48.6	291.4	11	32.4	3.4	202	13.7	291.0	15	27.4	3.0	191	5.8	290.4	18	47.2	2.5	179	19.1	289.9	21	20.8	1.7	166	54.0	289.4	22	56.3	0.9	153	57.9	289.1	23	23.1	-0.2
20	217	40.0		11	35.8		207	4.7		15	30.4		195	56.2		18	49.7		184	9.0		21	22.6		171	43.5		22	57.2		158	46.9		23	23.0	
40	222	31.4		11	39.3		211	55.7		15	33.4		200	46.7		18	52.2		188	58.9		21	24.3		176	32.9		22	58.0		163	36.0		23	22.8	
22 0	227	22.7	291.3	11	42.7	3.4	216	46.6	290.9	15	36.5	3.0	205	37.1	290.4	18	54.7	2.4	193	48.8	289.9	21	26.0	1.7	181	22.2	289.4	22	58.9	0.8	168	25.0	289.0	23	22.6	-0.2
20	232	14.1		11	46.2		221	37.6		15	39.5		210	27.5		18	57.1		198	38.7		21	27.8		186	11.6		23	59.7		173	14.1		23	22.4	
40	237	5.4		11	49.6		226	28.5		15	42.5		215	18.0		18	59.5		203	28.6		21	29.5		191	1.0		23	0.5		178	3.1		23	22.2	
23 0	241	56.8	291.3	11	53.0	3.4	231	19.4	290.9	15	45.5	3.0	220	8.4	290.4	19	2.0	2.4	208	18.4	289.9	21	31.2	1.7	195	50.4	289.4	23	1.3	0.8	182	52.2	289.0	23	22.0	-0.2
20	246	48.1		11	56.5		236	10.4		15	48.5		224	58.8		19	4.4		213	8.3		21	32.8		200	39.8		23	2.1		187	41.2		23	21.8	
40	251	39.5		11	59.9		241	1.3		15	51.5		229	49.2		19	6.8		217	58.2		21	34.5		205	29.1		23	2.9		192	30.3		23	21.5	

2011 Moon

	30 Jun						1 Jul						2 Jul						3 Jul						4 Jul						5 Jul					
	GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec		
h m	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'
0 0	197	19.3	289.0	23	21.3		184	4.8	288.9	22	22.8		170	51.3	289.1	20	7.8		157	52.4	289.3	16	42.7		145	14.6	289.6	12	19.6		132	57.0	289.9	7	14.2	
20	202	8.3		23	21.0	-0.3	188	53.7		22	21.4	-1.4	175	40.4		20	5.4	-2.4	162	41.7		16	39.5	-3.3	150	4.2		12	15.6	-4.0	137	46.9		7	9.7	-4.5
40	206	57.4		23	20.7		193	42.6		22	20.0		180	29.4		20	3.0		167	31.0		16	36.2		154	53.9		12	11.6		142	36.8		7	5.3	
1 0	211	46.4	289.0	23	20.4		198	31.6	288.9	22	18.6		185	18.5	289.1	20	0.6		172	20.4	289.3	16	32.8		159	43.5	289.6	12	7.6		147	26.6	289.9	7	0.8	
20	216	35.4		23	20.0	-0.4	203	20.5		22	17.2	-1.4	190	7.5		19	58.2	-2.4	177	9.7		16	29.5	-3.3	164	33.1		12	3.6	-4.0	152	16.5		6	56.3	-4.5
40	221	24.4		23	19.7		208	9.4		22	15.8		194	56.6		19	55.7		181	59.0		16	26.2		169	22.8		11	59.6		157	6.4		6	51.9	
2 0	226	13.4	289.0	23	19.3		212	58.4	288.9	22	14.4		199	45.7	289.1	19	53.3		186	48.4	289.4	16	22.8		174	12.4	289.7	11	55.6		161	56.3	289.9	6	47.4	
20	231	2.5		23	19.0	-0.4	217	47.3		22	12.9	-1.5	204	34.8		19	50.8	-2.5	191	37.7		16	19.5	-3.4	179	2.1		11	51.5	-4.1	166	46.1		6	42.9	-4.5
40	235	51.5		23	18.6		222	36.2		22	11.5		209	23.8		19	48.3		196	27.1		16	16.1		183	51.7		11	47.5		171	36.0		6	38.4	
3 0	240	40.5	289.0	23	18.2		227	25.2	288.9	22	10.0		214	12.9	289.1	19	45.8		201	16.4	289.4	16	12.7		188	41.4	289.7	11	43.4		176	25.9	289.9	6	33.9	
20	245	29.5		23	17.8	-0.4	232	14.1		22	8.5	-1.5	219	2.0		19	43.3	-2.5	206	5.8		16	9.3	-3.4	193	31.1		11	39.3	-4.1	181	15.8		6	29.4	-4.5
40	250	18.5		23	17.3		237	3.1		22	7.0		223	51.1		19	40.8		210	55.2		16	5.9		198	20.7		11	35.3		186	5.7		6	24.9	
4 0	255	7.5	289.0	23	16.9		241	52.0	288.9	22	5.5		228	40.2	289.1	19	38.2		215	44.5	289.4	16	2.5		203	10.4	289.7	11	31.2		190	55.6	289.9	6	20.4	
20	259	56.5		23	16.4	-0.5	246	40.9		22	4.0	-1.6	233	29.3		19	35.7	-2.6	220	33.9		15	59.1	-3.4	208	0.1		11	27.1	-4.1	195	45.5		6	15.9	-4.5
40	264	45.5		23	16.0		251	29.9		22	2.4		238	18.4		19	33.1		225	23.3		15	55.7		212	49.8		11	23.0		200	35.4		6	11.4	
5 0	269	34.5	289.0	23	15.5		256	18.8	288.9	22	0.8		243	7.5	289.1	19	30.5		230	12.7	289.4	15	52.2		217	39.4	289.7	11	18.9		205	25.3	289.9	6	6.8	
20	274	23.5		23	15.0	-0.5	261	7.8		21	59.3	-1.6	247	56.6		19	27.9	-2.6	235	2.1		15	48.8	-3.5	222	29.1		11	14.8	-4.1	210	15.2		6	2.3	-4.5
40	279	12.5		23	14.4		265	56.7		21	57.7		252	45.7		19	25.3		239	51.5		15	45.3		227	18.8		11	10.7		215	5.1		5	57.8	
6 0	284	1.5	289.0	23	13.9		270	45.7	288.9	21	56.1		257	34.8	289.1	19	22.7		244	40.9	289.4	15	41.8		232	8.5	289.7	11	6.6		219	55.0	289.9	5	53.3	
20	288	50.4		23	13.3	-0.6	275	34.6		21	54.4	-1.7	262	23.9		19	20.1	-2.6	249	30.3		15	38.4	-3.5	236	58.2		11	2.4	-4.2	224	44.9		5	48.7	-4.6
40	293	39.4		23	12.8		280	23.6		21	52.8		267	13.0		19	17.5		254	19.7		15	34.9		241	47.9		10	58.3		229	34.8		5	44.2	
7 0	298	28.4	289.0	23	12.2		285	12.5	289.0	21	51.1		272	2.2	289.1	19	14.8		259	9.1	289.4	15	31.4		246	37.6	289.7	10	54.1		234	24.8	289.9	5	39.6	
20	303	17.4		23	11.6	-0.6	290	1.5		21	49.5	-1.7	276	51.3		19	12.1	-2.7	263	58.5		15	27.8	-3.5	251	27.3		10	50.0	-4.1	239	14.7		5	35.1	-4.5
40	308	6.4		23	11.0		294	50.4		21	47.8		281	40.4		19	9.4		268	47.9		15	24.3		256	17.0		10	45.8		244	4.6		5	30.5	
8 0	312	55.3	289.0	23	10.4		299	39.4	289.0	21	46.1		286	29.6	289.1	19	6.7		273	37.3	289.4	15	20.8		261	6.8	289.7	10	41.7		248	54.5	289.9	5	26.0	
20	317	44.3		23	9.7	-0.7	304	28.3		21	44.4	-1.7	291	18.7		19	4.0	-2.7	278	26.8		15	17.2	-3.6	265	56.5		10	37.5	-4.2	253	44.4		5	21.4	-4.6
40	322	33.3		23	9.1		309	17.3		21	42.7		296	7.8		19	1.3		283	16.2		15	13.7		270	46.2		10	33.3		258	34.4		5	16.9	
9 0	327	22.3	289.0	23	8.4		314	6.2	289.0	21	40.9		300	57.0	289.1	18	58.6		288	5.6	289.4	15	10.1		275	35.9	289.7	10	29.1		263	24.3	289.9	5	12.3	
20	332	11.2		23	7.7	-0.7	318	55.2		21	39.2	-1.8	305	46.1		18	55.8	-2.8	292	55.1		15	6.5	-3.6	280	25.6		10	24.9	-4.2	268	14.2		5	7.7	-4.6
40	337	0.2		23	7.0		323	44.2		21	37.4		310	35.3		18	53.1		297	44.5		15	2.9		285	15.4		10	20.7		273	4.1		5	3.2	
10 0	341	49.2	289.0	23	6.3		328	33.1	289.0	21	35.6		315	24.4	289.2	18	50.3		302	33.9	289.5	14	59.3		290	5.1	289.7	10	16.5		277	54.1	289.9	4	58.6	
20	346	38.1		23	5.6	-0.7	333	22.1		21	33.8	-1.8	320	13.6		18	47.5	-2.8	307	23.4		14	55.7	-3.6	294	54.9		10	12.3	-4.2	282	44.0		4	54.0	-4.6
40	351	27.1		23	4.8		338	11.0		21	32.0		325	2.7		18	44.7		312	12.9		14	52.1		299	44.6		10	8.1		287	33.9		4	49.4	
11 0	356	16.0	289.0	23	4.1		343	0.0	289.0	21	30.2		329	51.9	289.2	18	41.9		317	2.3	289.5	14	48.5		304	34.4	289.8	10	3.8		292	23.9	289.9	4	44.8	
20	1	5.0		23	3.3	-0.8	347	49.0		21	28.3	-1.9	334	41.1		18	39.1	-2.8	321	51.8		14	44.8	-3.7	309	24.1		9	59.6	-4.2	297	13.8		4	40.3	-4.6
40	5	54.0		23	2.5		352	37.9		21	26.5		339	30.2		18	36.2		326	41.3		14	41.2		314	13.9		9	55.4		302	3.7		4	35.7	
12 0	10	42.9	289.0	23	1.7		357	26.9	289.0	21	24.6		344	19.4	289.2	18	33.4		331	30.7	289.5	14	37.5		319	3.6	289.8	9	51.1		306	53.7	289.9	4	31.1	
20	15	31.9		23	0.9	-0.8	2	15.9		21	22.7	-1.9	349	8.6		18	30.5	-2.9	336	20.2		14	33.9	-3.7	323	53.4		9	46.9	-4.3	311	43.6		4	26.5	-4.6
40	20	20.8		23	0.1		7	4.9		21	20.8		353	57.8		18	27.7		341	9.7		14	30.2		328	43.1		9	42.6		316	33.6		4	21.9	
13 0	25	9.8	288.9	22	59.2		11	53.8	289.0	21	18.9		358	47.0	289.2	18	24.8		345	59.2	289.5	14	26.5		333	32.9	289.8	9	38.3		321	23.5	289.9	4	17.3	
20	29	58.7		22	58.3	-0.9	16	42.8		21	17.0	-1.9	3	36.2		18	21.9	-2.9	350	48.7		14	22.8	-3.7	338	22.7		9	34.1	-4.3	326	13.5		4	12.7	-4.6
40	34	47.7		22	57.5		21	31.8		21	15.0		8	25.4		18	19.0		355	38.2		14	19.1		343	12.5		9	29.8		331	3.4		4	8.1	
14 0	39	36.6	288.9	22	56.6		26	20.8	289.0	21	13.1		13	14.6	289.2	18	16.0		0	27.7	289.5	14	15.4		348	2.2	289.8	9	25.5		335	53.4	290.0	4	3.4	
20	44	25.6		22	55.7	-0.9	31	9.8		21	11.1	-2.0	18	3.8		18	13.1	-2.9	5	17.2		14	11.6	-3.7	352	52.0		9	21.2	-4.3	340	43.3		3	58.8	-4.6
40	49	14.5		22	54.7		35	58.8		21	9.1		22	53.0		18	10.2		10	6.7		14	7.9		357	41.8		9	16.9		345	33.3		3	54.2	
15 0	54	3.4	288.9	22	53.8		40	47.7	289.0	21	7.1		27	42.2	289.2	18	7.2		14	56.2	289.5	14	4.2		2	31.6	289.8	9	12.6		350	23.2	290.0	3	49.6	
20	58	52.4		22	52.8	-1.0	45	36.7		21	5.1	-2.0	32	31.4		18	4.2	-3.0	19	45.7		14	0.4	-3.8	7	21.4		9	8.3	-4.3	355	13.2		3	45.0	-4.6
40	63	41.3		22	51.9		50	25.7		21	3.1		37	20.6		18	1.2		24	35.2		13	56.6		12	11.2		9	4.0		0	3.1		3	40.3	
16 0	68	30.3	288.9	22	50.9		55	14.7	289.0	21	1.0		42	9.8	289.2	17	58.2		29	24.8	289.5	13	52.9		17	1.0	289.8	8	59.6		4	53.1	290.0	3	35.7	
20	73	19.2		22	49.9	-1.0	60	3.7		20	59.0	-2.1	46	59.0		17	55.2	-3.0	34	14.3		13	49.1	-3.8	21	50.8		8	55.3	-4.3	9	43.0		3	31.1	-4.6
40	78	8.2		22	48.9		64	52.7		20	56.9		51	48.3		17	52.2		39	3.8		13	45.3		26	40.6		8	51.0		14	33.0		3	26.5	
17 0	82	57.1	288.9	22	47.8		69	41.7	289.0	20	54.8		56	37.5	289.2	17	49.2		43	53.4	289.5	13	41.5		31	30.4	289.8	8	46.6		19	23.0	290.0	3	21.8	
20	87	46.0		22	46.8	-1.0	74	30.7		20	52.7	-2.1	61	26.8		17	46.1	-3.1	48	42.9		13	37.7	-3.8	36	20.2		8	42.3	-4.3	24	12.9		3	17.2	-4.6
40	92	35.0		22	45.7		79	19.7		20	50.6		66	16.0		17	43.1		53	32.4		13	33.9		41	10.0		8	37.9		29	2.9		3	12.5	
18 0	97	23.9	288.9	22	44.7		84	8.7	289.0	20	48.5		71	5.2	289.3	17	40.0		58	22.0	289.6	13	30.0		45	59.8	289.8	8	33.6		33	52.9	290.0	3	7.9	
20	102	12.9		22	43.6	-1.1	88	57.7		20	46.3	-2.2	75	54.5		17	36.9	-3.1	63	11.5		13	26.2	-3.8	50	49.6		8	29.2	-4.4	38	42.8		3	3.3	-4.6
40	107	1.8		22	42.5		93	46.8		20	44.2		80	43.7		17	33.8		68	1.1		13	22.3		55	39.5		8	24.8		43	32.8		2	58.6	
19 0	111	50.7	288.9	22	41.3		98	35.8	289.0	20	42.0		85	33.0	289.3	17	30.7		72	50.7	289.6	13	18.5		60	29.3	289.8	8	20.5		48	22.7	290.0	2	54.0	
20	116	39.7		22	40.2	-1.1	103	24.8		20	39.8	-2.2	90	22.3		17	27.6	-3.1	77	40.2		13	14.6	-3.9	65	19.1		8	16.1	-4.4	53	12.7		2	49.3	-4.7
40	121	28.6		22	39.1		108	13.8		20	37.6		95	11.5		17	24.5		82	29.8		13	10.8		70	9.0		8	11.7		58	2.7		2	44.7	
20 0	126	17.5	288.9	22	37.9		113	2.8	289.0	20	35.4		100	0.8	289.3	17	21.3		87	19.4	289.6	13	6.9		74	58.8	289.8	8	7.3		62	52.7	290.0	2	40.0	
20	131	6.5		22	36.7	-1.2	117	51.8		20	33.2	-2.2	104	50.1		17	18.2	-3.2	92	9.0		13	3.0	-3.9	79	48.6		8	2.9	-4.4	67	42.6		2	35.4	-4.7
40	135	55.4		22	35.5		122	40.9		20	31.0		109	39.4		17	15.0		96	58.5		12	59.1		84	38.5		7	58.5		72	32.6		2	30.7	
21 0	140	44.3	288.9	22	34.3		127	29.9	289.0	20	28.7		114	28.6	289.3	17	11.8		101	48.1	289.6	12	55.2		89	28.3	289.8	7	54.1		77	22.6	290.0	2	26.0	
20	145	33.3		22	33.1	-1.2	132	18.9		20	26.4	-2.3	119	17.9		17	8.7	-3.2	106	37.7		12	51.3	-3.9	94	18.2		7	49.7	-4.4	82	12.5		2	21.4	-4.6
40	150	22.2		22	31.9		137	8.0		20	24.2		124	7.2		17	5.5		111	27.3		12	47.3		99	8.0		7	45.3		87	2.5		2	16.7	
22 0	155	11.1	288.9	22	30.6		141	57.0	289.0	20	21.9		128	56.5	289.3	17	2.3		116	16.9	289.6	12	43.4		103	57.9	289.9	7	40.8		91	52.5	290.0	2	12.1	
20	160	0.1		22	29.3	-1.3	146	46.1		20	19.6	-2.3	133	45.8		16	59.0	-3.2	121	6.5		12	39.5	-4.0	108	47.7		7	36.4	-4.4	96	42.5		2	7.4	-4.7
40	164	49.0		22	28.0		151	35.1		20	17.2		138	35.1		16	55.8		125	56.1		12	35.5		113	37.6		7	32.0		101	32.4		2	2.7	
23 0	169	37.9	288.9	22	26.7		156	24.1	289.1	20	14.9		143	24.4	289.3	16	52.6		130	45.7	289.6	12	31.5		118	27.4	289.9	7	27.5		106	22.4	290.0	1	58.0	
20	174	26.9		22	25.4	-1.3	161	13.2		20	12.5	-2.4	148	13.7		16	49.3	-3.3	135	35.4		12	27.6	-4.0	123	17.3		7	23.1	-4.4	111	12.4		1	53.4	-4.7
40	179	15.8		22	24.1		166	2.2		20	10.2		153	3.0		16	46.0		140	25.0		12	23.6		128	7.1		7	18.6		116	2.3		1	48.7	

2011 Moon

	6 Jul						7 Jul						8 Jul						9 Jul						10 Jul						11 Jul					
	GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec		
h m	°	'	d	°	'	d '	°	'	d	°	'	d '	°	'	d	°	'	d '	°	'	d	°	'	d '	°	'	d	°	'	d '	°	'	d	°	'	d '
0 0	120	52.3	290.0	1	44.0	-4.7	108	49.4	289.9	-3	52.6	-4.6	96	35.5	289.7	-9	17.4	-4.3	83	59.3	289.3	-14	11.9	-3.8	70	53.1	288.9	-18	18.0	-3.0	57	16.7	288.5	-21	18.9	-2.0
20	125	42.3		1	39.4		113	39.3		-3	57.3		101	25.2		-9	21.7		88	48.6		-14	15.7		75	42.0		-18	21.0		62	5.2		-21	20.9	
40	130	32.3		1	34.7		118	29.2		-4	1.9		106	14.9		-9	26.1		93	37.9		-14	19.5		80	30.8		-18	24.0		66	53.7		-21	22.9	
1 0	135	22.3	290.0	1	30.0	-4.7	123	19.1	289.9	-4	6.5	-4.6	111	4.5	289.7	-9	30.4	-4.3	98	27.2	289.3	-14	23.2	-3.8	85	19.7	288.8	-18	26.9	-3.0	71	42.1	288.5	-21	24.8	-1.9
20	140	12.2		1	25.3		128	9.0		-4	11.1		115	54.2		-9	34.7		103	16.4		-14	27.0		90	8.5		-18	29.9		76	30.6		-21	26.8	
40	145	2.2		1	20.7		132	58.9		-4	15.8		120	43.9		-9	39.0		108	5.7		-14	30.8		94	57.3		-18	32.8		81	19.1		-21	28.7	
2 0	149	52.2	290.0	1	16.0	-4.7	137	48.8	289.9	-4	20.4	-4.6	125	33.5	289.6	-9	43.4	-4.3	112	55.0	289.3	-14	34.5	-3.7	99	46.2	288.8	-18	35.8	-2.9	86	7.5	288.5	-21	30.6	-1.9
20	154	42.2		1	11.3		142	38.7		-4	25.0		130	23.2		-9	47.7		117	44.2		-14	38.2		104	35.0		-18	38.7		90	56.0		-21	32.5	
40	159	32.1		1	6.6		147	28.6		-4	29.6		135	12.8		-9	52.0		122	33.5		-14	42.0		109	23.8		-18	41.6		95	44.4		-21	34.4	
3 0	164	22.1	290.0	1	1.9	-4.7	152	18.5	289.9	-4	34.2	-4.6	140	2.4	289.6	-9	56.2	-4.3	127	22.7	289.2	-14	45.7	-3.7	114	12.6	288.8	-18	44.5	-2.9	100	32.9	288.4	-21	36.2	-1.8
20	169	12.1		0	57.3		157	8.4		-4	38.9		144	52.1		-10	0.5		132	12.0		-14	49.4		119	1.4		-18	47.4		105	21.3		-21	38.1	
40	174	2.1		0	52.6		161	58.3		-4	43.5		149	41.7		-10	4.8		137	1.2		-14	53.1		123	50.2		-18	50.2		110	9.8		-21	39.9	
4 0	178	52.0	290.0	0	47.9	-4.7	166	48.2	289.9	-4	48.1	-4.6	154	31.3	289.6	-10	9.1	-4.3	141	50.4	289.2	-14	56.8	-3.7	128	39.0	288.8	-18	53.1	-2.8	114	58.2	288.4	-21	41.7	-1.8
20	183	42.0		0	43.2		171	38.0		-4	52.7		159	20.9		-10	13.4		146	39.7		-15	0.4		133	27.8		-18	55.9		119	46.6		-21	43.5	
40	188	32.0		0	38.5		176	27.9		-4	57.3		164	10.6		-10	17.6		151	28.9		-15	4.1		138	16.6		-18	58.7		124	35.1		-21	45.3	
5 0	193	22.0	290.0	0	33.8	-4.7	181	17.8	289.9	-5	1.9	-4.6	169	0.2	289.6	-10	21.9	-4.2	156	18.1	289.2	-15	7.8	-3.6	143	5.4	288.8	-19	1.6	-2.8	129	23.5	288.4	-21	47.1	-1.7
20	198	12.0		0	29.1		186	7.7		-5	6.5		173	49.8		-10	26.1		161	7.3		-15	11.4		147	54.1		-19	4.4		134	11.9		-21	48.8	
40	203	1.9		0	24.5		190	57.6		-5	11.1		178	39.4		-10	30.4		165	56.5		-15	15.0		152	42.9		-19	7.2		139	0.3		-21	50.6	
6 0	207	51.9	290.0	0	19.8	-4.7	195	47.4	289.9	-5	15.6	-4.6	183	29.0	289.6	-10	34.6	-4.2	170	45.7	289.2	-15	18.7	-3.6	157	31.7	288.7	-19	9.9	-2.8	143	48.8	288.4	-21	52.3	-1.7
20	212	41.9		0	15.1		200	37.3		-5	20.2		188	18.5		-10	38.8		175	34.9		-15	22.3		162	20.4		-19	12.7		148	37.2		-21	54.0	
40	217	31.9		0	10.4		205	27.2		-5	24.8		193	8.1		-10	43.0		180	24.1		-15	25.9		167	9.2		-19	15.4		153	25.6		-21	55.7	
7 0	222	21.8	290.0	0	5.7	-4.7	210	17.0	289.9	-5	29.4	-4.6	197	57.7	289.6	-10	47.2	-4.2	185	13.2	289.2	-15	29.5	-3.6	171	57.9	288.7	-19	18.2	-2.7	158	14.0	288.4	-21	57.4	-1.6
20	227	11.8		0	1.0		215	6.9		-5	34.0		202	47.3		-10	51.5		190	2.4		-15	33.1		176	46.6		-19	20.9		163	2.4		-21	59.0	
40	232	1.8		-0	3.7		219	56.7		-5	38.5		207	36.9		-10	55.7		194	51.6		-15	36.6		181	35.4		-19	23.6		167	50.8		-22	0.7	
8 0	236	51.8	290.0	-0	8.4	-4.7	224	46.6	289.8	-5	43.1	-4.6	212	26.4	289.6	-10	59.8	-4.2	199	40.7	289.1	-15	40.2	-3.5	186	24.1	288.7	-19	26.3	-2.7	172	39.2	288.4	-22	2.3	-1.6
20	241	41.7		-0	13.1		229	36.4		-5	47.7		217	16.0		-11	4.0		204	29.9		-15	43.7		191	12.8		-19	29.0		177	27.6		-22	3.9	
40	246	31.7		-0	17.7		234	26.3		-5	52.2		222	5.5		-11	8.2		209	19.0		-15	47.3		196	1.5		-19	31.6		182	16.0		-22	5.5	
9 0	251	21.7	290.0	-0	22.4	-4.7	239	16.1	289.8	-5	56.8	-4.5	226	55.1	289.5	-11	12.4	-4.1	214	8.2	289.1	-15	50.8	-3.5	200	50.2	288.7	-19	34.3	-2.6	187	4.3	288.4	-22	7.1	-1.6
20	256	11.7		-0	27.1		244	6.0		-6	1.3		231	44.6		-11	16.5		218	57.3		-15	54.3		205	38.9		-19	36.9		191	52.7		-22	8.7	
40	261	1.6		-0	31.8		248	55.8		-6	5.9		236	34.2		-11	20.7		223	46.4		-15	57.8		210	27.6		-19	39.5		196	41.1		-22	10.2	
10 0	265	51.6	290.0	-0	36.5	-4.7	253	45.6	289.8	-6	10.4	-4.6	241	23.7	289.5	-11	24.8	-4.2	228	35.6	289.1	-16	1.3	-3.5	215	16.3	288.7	-19	42.2	-2.6	201	29.5	288.4	-22	11.8	-1.5
20	270	41.6		-0	41.2		258	35.5		-6	15.0		246	13.2		-11	29.0		233	24.7		-16	4.8		220	5.0		-19	44.8		206	17.8		-22	13.3	
40	275	31.5		-0	45.9		263	25.3		-6	19.5		251	2.8		-11	33.1		238	13.8		-16	8.3		224	53.7		-19	47.3		211	6.2		-22	14.8	
11 0	280	21.5	290.0	-0	50.6	-4.7	268	15.1	289.8	-6	24.1	-4.5	255	52.3	289.5	-11	37.3	-4.1	243	2.9	289.1	-16	11.8	-3.4	229	42.4	288.7	-19	49.9	-2.5	215	54.6	288.4	-22	16.3	-1.4
20	285	11.5		-0	55.3		273	5.0		-6	28.6		260	41.8		-11	41.4		247	52.0		-16	15.2		234	31.0		-19	52.5		220	43.0		-22	17.7	
40	290	1.4		-0	59.9		277	54.8		-6	33.1		265	31.3		-11	45.5		252	41.1		-16	18.7		239	19.7		-19	55.0		225	31.3		-22	19.2	
12 0	294	51.4	290.0	-1	4.6	-4.7	282	44.6	289.8	-6	37.6	-4.5	270	20.8	289.5	-11	49.6	-4.1	257	30.2	289.1	-16	22.1	-3.4	244	8.4	288.6	-19	57.5	-2.5	230	19.7	288.4	-22	20.6	-1.4
20	299	41.4		-1	9.3		287	34.4		-6	42.2		275	10.3		-11	53.7		262	19.2		-16	25.5		248	57.0		-20	0.0		235	8.0		-22	22.0	
40	304	31.3		-1	14.0		292	24.2		-6	46.7		279	59.8		-11	57.8		267	8.3		-16	28.9		253	45.7		-20	2.5		239	56.4		-22	23.4	
13 0	309	21.3	290.0	-1	18.7	-4.7	297	14.0	289.8	-6	51.2	-4.5	284	49.3	289.5	-12	1.9	-4.1	271	57.4	289.1	-16	32.3	-3.4	258	34.3	288.6	-20	5.0	-2.5	244	44.7	288.3	-22	24.8	-1.4
20	314	11.3		-1	23.4		302	3.8		-6	55.7		289	38.8		-12	5.9		276	46.4		-16	35.7		263	22.9		-20	7.5		249	33.1		-22	26.2	
40	319	1.2		-1	28.1		306	53.6		-7	0.2		294	28.2		-12	10.0		281	35.5		-16	39.1		268	11.6		-20	10.0		254	21.4		-22	27.6	
14 0	323	51.2	290.0	-1	32.7	-4.7	311	43.4	289.8	-7	4.7	-4.5	299	17.7	289.5	-12	14.1	-4.0	286	24.5	289.0	-16	42.5	-3.3	273	0.2	288.6	-20	12.4	-2.4	259	9.8	288.3	-22	28.9	-1.3
20	328	41.2		-1	37.4		316	33.2		-7	9.2		304	7.2		-12	18.1		291	13.6		-16	45.8		277	48.8		-20	14.8		263	58.1		-22	30.2	
40	333	31.1		-1	42.1		321	23.0		-7	13.7		308	56.6		-12	22.1		296	2.6		-16	49.2		282	37.4		-20	17.2		268	46.5		-22	31.5	
15 0	338	21.1	290.0	-1	46.8	-4.7	326	12.8	289.8	-7	18.2	-4.5	313	46.1	289.4	-12	26.2	-4.0	300	51.6	289.0	-16	52.5	-3.3	287	26.0	288.6	-20	19.6	-2.4	273	34.8	288.3	-22	32.8	-1.3
20	343	11.0		-1	51.5		331	2.6		-7	22.7		318	35.6		-12	30.2		305	40.7		-16	55.8		292	14.6		-20	22.0		278	23.1		-22	34.1	
40	348	1.0		-1	56.1		335	52.3		-7	27.1		323	25.0		-12	34.2		310	29.7		-16	59.1		297	3.2		-20	24.4		283	11.5		-22	35.4	
16 0	352	50.9	290.0	-2	0.8	-4.7	340	42.1	289.8	-7	31.6	-4.5	328	14.4	289.4	-12	38.2	-4.0	315	18.7	289.0	-17	2.4	-3.3	301	51.8	288.6	-20	26.8	-2.3	287	59.8	288.3	-22	36.6	-1.2
20	357	40.9		-2	5.5		345	31.9		-7	36.1		333	3.9		-12	42.2		320	7.7		-17	5.7		306	40.4		-20	29.1		292	48.1		-22	37.8	
40	2	30.8		-2	10.2		350	21.7		-7	40.5		337	53.3		-12	46.2		324	56.7		-17	9.0		311	29.0		-20	31.4		297	36.4		-22	39.1	
17 0	7	20.8	289.9	-2	14.8	-4.7	355	11.4	289.8	-7	45.0	-4.4	342	42.7	289.4	-12	50.2	-4.0	329	45.7	289.0	-17	12.2	-3.3	316	17.6	288.6	-20	33.7	-2.3	302	24.8	288.3	-22	40.2	-1.2
20	12	10.7		-2	19.5		0	1.2		-7	49.4		347	32.1		-12	54.2		334	34.7		-17	15.5		321	6.2		-20	36.0		307	13.1		-22	41.4	
40	17	0.7		-2	24.2		4	50.9		-7	53.9		352	21.6		-12	58.2		339	23.7		-17	18.7		325	54.8		-20	38.3		312	1.4		-22	42.6	
18 0	21	50.6	289.9	-2	28.9	-4.7	9	40.7	289.7	-7	58.3	-4.4	357	11.0	289.4	-13	2.1	-4.0	344	12.6	289.0	-17	22.0	-3.2	330	43.3	288.6	-20	40.6	-2.2	316	49.7	288.3	-22	43.7	-1.1
20	26	40.6		-2	33.5		14	30.4		-8	2.8		2	0.4		-13	6.1		349	1.6		-17	25.2		335	31.9		-20	42.9		321	38.1		-22	44.9	
40	31	30.5		-2	38.2		19	20.2		-8	7.2		6	49.7		-13	10.0		353	50.6		-17	28.4		340	20.4		-20	45.1		326	26.4		-22	46.0	
19 0	36	20.5	289.9	-2	42.9	-4.6	24	9.9	289.7	-8	11.6	-4.4	11	39.1	289.4	-13	14.0	-3.9	358	39.5	288.9	-17	31.6	-3.2	345	9.0	288.5	-20	47.3	-2.2	331	14.7	288.3	-22	47.1	-1.1
20	41	10.4		-2	47.5		28	59.7		-8	16.0		16	28.5		-13	17.9		3	28.5		-17	34.8		349	57.5		-20	49.5		336	3.0		-22	48.2	
40	46	0.3		-2	52.2		33	49.4		-8	20.5		21	17.9		-13	21.8		8	17.4		-17	37.9		354	46.1		-20	51.7		340	51.3		-22	49.2	
20 0	50	50.3	289.9	-2	56.8	-4.7	38	39.1	289.7	-8	24.9	-4.4	26	7.3	289.4	-13	25.7	-3.9	13	6.3	288.9	-17	41.1	-3.1	359	34.6	288.5	-20	53.9	-2.2	345	39.6	288.3	-22	50.3	-1.0
20	55	40.2		-3	1.5		43	28.8		-8	29.3		30	56.6		-13	29.6		17	55.3		-17	44.2		4	23.1		-20	56.1		350	27.9		-22	51.3	
40	60	30.1		-3	6.2		48	18.6		-8	33.7		35	46.0		-13	33.5		22	44.2		-17	47.4		9	11.7		-20	58.2		355	16.2		-22	52.3	
21 0	65	20.1	289.9	-3	10.8	-4.7	53	8.3	289.7	-8	38.1	-4.4	40	35.4	289.3	-13	37.4	-3.9	27	33.1	288.9	-17	50.5	-3.1	14	0.2	288.5	-21	0.4	-2.1	0	4.5	288.3	-22	53.3	-1.0
20	70	10.0		-3	15.5		57	58.0		-8	42.5		45	24.7		-13	41.2		32	22.0		-17	53.6		18	48.7		-21	2.5		4	52.8		-22	54.3	
40	74	59.9		-3	20.1		62	47.7		-8	46.9		50	14.0		-13	45.1		37	10.9		-17	56.7		23	37.2		-21	4.6		9	41.1		-22	55.3	
22 0	79	49.9	289.9	-3	24.8	-4.6	67	37.4	289.7	-8	51.2	-4.4	55	3.4	289.3	-13	49.0	-3.8	41	59.8	288.9	-17	59.8	-3.0	28	25.7	288.5	-21	6.7	-2.1	14	29.4	288.3	-22	56.2	-0.9
20	84	39.8		-3	29.4		72	27.1		-8	55.6		59	52.7		-13	52.8		46	48.7		-18	2.8		33	14.3		-21	8.8		19	17.8		-22	57.1	
40	89	29.7		-3	34.1		77	16.8		-9	0.0		64	42.0		-13	56.7		51	37.6		-18	5.9		38	2.8		-21	10.8		24	6.0		-22	58.1	
23 0	94	19.6	289.9	-3	38.7	-4.6	82	6.5	289.7	-9	4.3	-4.4	69	31.4	289.3	-14	0.5	-3.8	56	26.5	288.9	-18	8.9	-3.0	42	51.3	288.5	-21	12.9	-2.0	28	54.3	288.3	-22	59.0	-0.9
20	99	9.5		-3	43.3		86	56.2		-9	8.7		74	20.7		-14	4.3		61	15.4		-18	12.0		47	39.7		-21	14.9		33	42.6		-22	59.8	
40	103	59.5		-3	48.0		91	45.9		-9	13.1		79	10.0		-14	8.1		66	4.2		-18	15.0		52	28.2		-21	16.9		38	30.9		-23	0.7	

2011 Moon

	12 Jul							13 Jul							14 Jul							15 Jul							16 Jul							17 Jul						
	GHA			Dec				GHA			Dec				GHA			Dec				GHA			Dec				GHA			Dec				GHA			Dec			
h m	°	'	d	°	'	d	'	°	'	d	°	'	d	'	°	'	d	°	'	d	'	°	'	d	°	'	d	'	°	'	d	°	'	d	'	°	'	d	°	'	d	'
0 0	43	19.2	288.3	-23	1.6	-0.8		29	18.4	288.4	-23	19.2	0.4		15	35.3	288.8	-22	13.3	1.5		2	28.1	289.4	-19	53.3	2.4		350	6.2	290.0	-16	33.7	3.1		338	30.4	290.6	-12	30.9	3.6	
20	48	7.5		-23	2.4			34	6.8		-23	18.8			20	24.1		-22	11.9			7	17.4		-19	50.9			354	56.2		-16	30.6			343	21.0		-12	27.3		
40	52	55.8		-23	3.2			38	55.2		-23	18.5			25	12.9		-22	10.4			12	6.8		-19	48.5			359	46.2		-16	27.5			348	11.7		-12	23.7		
1 0	57	44.1	288.3	-23	4.0	-0.8		43	43.6	288.4	-23	18.1	0.4		30	1.7	288.8	-22	8.9	1.5		16	56.2	289.4	-19	46.1	2.4		4	36.3	290.1	-16	24.4	3.2		353	2.3	290.7	-12	20.1	3.6	
20	62	32.4		-23	4.8			48	32.0		-23	17.7			34	50.5		-22	7.4			21	45.6		-19	43.7			9	26.3		-16	21.2			357	53.0		-12	16.5		
40	67	20.7		-23	5.6			53	20.4		-23	17.2			39	39.4		-22	5.9			26	35.0		-19	41.2			14	16.4		-16	18.1			2	43.7		-12	12.9		
2 0	72	9.0	288.3	-23	6.3	-0.7		58	8.8	288.4	-23	16.8	0.5		44	28.2	288.8	-22	4.3	1.6		31	24.4	289.4	-19	38.8	2.5		19	6.5	290.1	-16	14.9	3.2		7	34.3	290.7	-12	9.3	3.7	
20	76	57.3		-23	7.0			62	57.2		-23	16.3			49	17.0		-22	2.8			36	13.9		-19	36.3			23	56.5		-16	11.8			12	25.0		-12	5.6		
40	81	45.6		-23	7.8			67	45.7		-23	15.9			54	5.9		-22	1.2			41	3.3		-19	33.8			28	46.6		-16	8.6			17	15.7		-12	2.0		
3 0	86	33.9	288.3	-23	8.5	-0.7		72	34.1	288.4	-23	15.4	0.5		58	54.7	288.9	-21	59.6	1.6		45	52.7	289.5	-19	31.3	2.5		33	36.7	290.1	-16	5.4	3.2		22	6.4	290.7	-11	58.3	3.6	
20	91	22.2		-23	9.1			77	22.5		-23	14.9			63	43.5		-21	58.0			50	42.2		-19	28.8			38	26.8		-16	2.2			26	57.1		-11	54.7		
40	96	10.5		-23	9.8			82	11.0		-23	14.4			68	32.4		-21	56.4			55	31.7		-19	26.3			43	17.0		-15	59.0			31	47.8		-11	51.0		
4 0	100	58.8	288.3	-23	10.5	-0.6		86	59.4	288.4	-23	13.8	0.6		73	21.3	288.9	-21	54.8	1.7		60	21.1	289.5	-19	23.8	2.6		48	7.1	290.1	-15	55.8	3.2		36	38.6	290.7	-11	47.4	3.7	
20	105	47.1		-23	11.1			91	47.8		-23	13.3			78	10.2		-21	53.2			65	10.6		-19	21.2			52	57.2		-15	52.6			41	29.3		-11	43.7		
40	110	35.4		-23	11.7			96	36.3		-23	12.7			82	59.0		-21	51.5			70	0.1		-19	18.7			57	47.4		-15	49.4			46	20.0		-11	40.1		
5 0	115	23.6	288.3	-23	12.3	-0.6		101	24.7	288.5	-23	12.1	0.6		87	47.9	288.9	-21	49.8	1.7		74	49.6	289.5	-19	16.1	2.6		62	37.5	290.2	-15	46.2	3.3		51	10.8	290.8	-11	36.4	3.7	
20	120	11.9		-23	12.9			106	13.2		-23	11.5			92	36.8		-21	48.2			79	39.1		-19	13.6			67	27.7		-15	42.9			56	1.5		-11	32.7		
40	125	0.2		-23	13.5			111	1.7		-23	10.9			97	25.7		-21	46.5			84	28.6		-19	11.0			72	17.8		-15	39.7			60	52.3		-11	29.0		
6 0	129	48.5	288.3	-23	14.0	-0.5		115	50.1	288.5	-23	10.3	0.7		102	14.6	288.9	-21	44.8	1.7		89	18.2	289.5	-19	8.4	2.6		77	8.0	290.2	-15	36.4	3.2		65	43.0	290.8	-11	25.4	3.7	
20	134	36.8		-23	14.6			120	38.6		-23	9.7			107	3.6		-21	43.1			94	7.7		-19	5.8			81	58.2		-15	33.2			70	33.8		-11	21.7		
40	139	25.1		-23	15.1			125	27.1		-23	9.0			111	52.5		-21	41.3			98	57.2		-19	3.2			86	48.4		-15	29.9			75	24.6		-11	18.0		
7 0	144	13.4	288.3	-23	15.6	-0.5		130	15.6	288.5	-23	8.3	0.7		116	41.4	289.0	-21	39.6	1.8		103	46.8	289.6	-19	0.6	2.7		91	38.6	290.2	-15	26.7	3.3		80	15.4	290.8	-11	14.3	3.7	
20	149	1.7		-23	16.1			135	4.0		-23	7.6			121	30.4		-21	37.8			108	36.3		-18	57.9			96	28.8		-15	23.4			85	6.2		-11	10.6		
40	153	50.0		-23	16.5			139	52.5		-23	6.9			126	19.3		-21	36.0			113	25.9		-18	55.3			101	19.1		-15	20.1			89	57.0		-11	6.9		
8 0	158	38.3	288.3	-23	17.0	-0.4		144	41.0	288.5	-23	6.2	0.8		131	8.3	289.0	-21	34.3	1.8		118	15.5	289.6	-18	52.6	2.7		106	9.3	290.3	-15	16.8	3.3		94	47.8	290.8	-11	3.2	3.7	
20	163	26.6		-23	17.4			149	29.5		-23	5.4			135	57.2		-21	32.5			123	5.1		-18	50.0			110	59.5		-15	13.5			99	38.6		-10	59.4		
40	168	14.9		-23	17.8			154	18.0		-23	4.7			140	46.2		-21	30.6			127	54.7		-18	47.3			115	49.8		-15	10.2			104	29.4		-10	55.7		
9 0	173	3.2	288.3	-23	18.2	-0.4		159	6.5	288.5	-23	3.9	0.8		145	35.2	289.0	-21	28.8	1.8		132	44.3	289.6	-18	44.6	2.7		120	40.0	290.3	-15	6.9	3.3		109	20.3	290.8	-10	52.0	3.7	
20	177	51.5		-23	18.6			163	55.1		-23	3.1			150	24.2		-21	27.0			137	33.9		-18	41.9			125	30.3		-15	3.5			114	11.1		-10	48.3		
40	182	39.8		-23	19.0			168	43.6		-23	2.3			155	13.2		-21	25.1			142	23.5		-18	39.2			130	20.6		-15	0.2			119	2.0		-10	44.5		
10 0	187	28.1	288.3	-23	19.3	-0.3		173	32.1	288.5	-23	1.5	0.8		160	2.2	289.0	-21	23.3	1.9		147	13.2	289.7	-18	36.5	2.7		135	10.9	290.3	-14	56.9	3.4		123	52.8	290.9	-10	40.8	3.7	
20	192	16.4		-23	19.7			178	20.6		-23	0.7			164	51.2		-21	21.4			152	2.8		-18	33.7			140	1.2		-14	53.5			128	43.7		-10	37.1		
40	197	4.7		-23	20.0			183	9.2		-22	59.8			169	40.2		-21	19.5			156	52.5		-18	31.0			144	51.5		-14	50.2			133	34.5		-10	33.3		
11 0	201	53.0	288.3	-23	20.3	-0.3		187	57.7	288.6	-22	59.0	0.9		174	29.3	289.0	-21	17.6	1.9		161	42.1	289.7	-18	28.3	2.8		149	41.8	290.3	-14	46.8	3.4		138	25.4	290.9	-10	29.6	3.8	
20	206	41.3		-23	20.6			192	46.3		-22	58.1			179	18.3		-21	15.7			166	31.8		-18	25.5			154	32.1		-14	43.5			143	16.3		-10	25.8		
40	211	29.6		-23	20.8			197	34.8		-22	57.2			184	7.4		-21	13.7			171	21.5		-18	22.7			159	22.4		-14	40.1			148	7.2		-10	22.1		
12 0	216	17.9	288.3	-23	21.1	-0.2		202	23.4	288.6	-22	56.3	1.0		188	56.4	289.1	-21	11.8	2.0		176	11.2	289.7	-18	20.0	2.8		164	12.8	290.4	-14	36.7	3.4		152	58.1	290.9	-10	18.3	3.8	
20	221	6.2		-23	21.3			207	11.9		-22	55.3			193	45.5		-21	9.8			181	0.9		-18	17.2			169	3.1		-14	33.3			157	49.0		-10	14.5		
40	225	54.5		-23	21.6			212	0.5		-22	54.4			198	34.5		-21	7.8			185	50.6		-18	14.4			173	53.5		-14	29.9			162	39.9		-10	10.8		
13 0	230	42.8	288.3	-23	21.8	-0.2		216	49.1	288.6	-22	53.4	1.0		203	23.6	289.1	-21	5.9	2.0		190	40.3	289.7	-18	11.6	2.8		178	43.8	290.4	-14	26.5	3.4		167	30.8	290.9	-10	7.0	3.8	
20	235	31.1		-23	21.9			221	37.6		-22	52.5			208	12.7		-21	3.9			195	30.0		-18	8.8			183	34.2		-14	23.1			172	21.7		-10	3.2		
40	240	19.5		-23	22.1			226	26.2		-22	51.5			213	1.8		-21	1.8			200	19.8		-18	5.9			188	24.6		-14	19.7			177	12.7		-9	59.4		
14 0	245	7.8	288.3	-23	22.3	-0.1		231	14.8	288.6	-22	50.5	1.0		217	50.9	289.1	-20	59.8	2.0		205	9.5	289.8	-18	3.1	2.9		193	15.0	290.4	-14	16.3	3.4		182	3.6	290.9	-9	55.6	3.8	
20	249	56.1		-23	22.4			236	3.4		-22	49.4			222	40.0		-20	57.8			209	59.3		-18	0.3			198	5.3		-14	12.9			186	54.5		-9	51.9		
40	254	44.4		-23	22.5			240	52.0		-22	48.4			227	29.2		-20	55.7			214	49.0		-17	57.4			202	55.7		-14	9.5			191	45.5		-9	48.1		
15 0	259	32.7	288.3	-23	22.6	-0.1		245	40.6	288.6	-22	47.4	1.1		232	18.3	289.1	-20	53.7	2.1		219	38.8	289.8	-17	54.5	2.9		207	46.2	290.4	-14	6.0	3.4		196	36.4	291.0	-9	44.3	3.8	
20	264	21.1		-23	22.7			250	29.2		-22	46.3			237	7.4		-20	51.6			224	28.6		-17	51.7			212	36.6		-14	2.6			201	27.4		-9	40.5		
40	269	9.4		-23	22.8			255	17.8		-22	45.2			241	56.6		-20	49.5			229	18.4		-17	48.8			217	27.0		-13	59.1			206	18.4		-9	36.7		
16 0	273	57.7	288.3	-23	22.8	0.0		260	6.5	288.6	-22	44.1	1.1		246	45.7	289.2	-20	47.4	2.1		234	8.2	289.8	-17	45.9	2.9		222	17.4	290.5	-13	55.7	3.5		211	9.4	291.0	-9	32.9	3.8	
20	278	46.1		-23	22.9			264	55.1		-22	43.0			251	34.9		-20	45.3			238	58.0		-17	43.0			227	7.9		-13	52.2			216	0.3		-9	29.1		
40	283	34.4		-23	22.9			269	43.7		-22	41.9			256	24.1		-20	43.2			243	47.8		-17	40.1			231	58.3		-13	48.7			220	51.3		-9	25.2		
17 0	288	22.7	288.3	-23	22.9	0.0		274	32.4	288.7	-22	40.7	1.2		261	13.2	289.2	-20	41.0	2.2		248	37.7	289.8	-17	37.1	2.9		236	48.8	290.5	-13	45.3	3.5		225	42.3	291.0	-9	21.4	3.8	
20	293	11.1		-23	22.9			279	21.0		-22	39.6			266	2.4		-20	38.9			253	27.5		-17	34.2			241	39.3		-13	41.8			230	33.3		-9	17.6		
40	297	59.4		-23	22.9			284	9.7		-22	38.4			270	51.6		-20	36.7			258	17.3		-17	31.3			246	29.8		-13	38.3			235	24.3		-9	13.8		
18 0	302	47.7	288.3	-23	22.8	0.1		288	58.3	288.7	-22	37.2	1.2		275	40.8	289.2	-20	34.5	2.2		263	7.2	289.9	-17	28.3	3.0		251	20.2	290.5	-13	34.8	3.5		240	15.3	291.0	-9	10.0	3.8	
20	307	36.1		-23	22.7			293	47.0		-22	36.0			280	30.1		-20	32.4			267	57.1		-17	25.4			256	10.7		-13	31.3			245	6.4		-9	6.1		
40	312	24.4		-23	22.7			298	35.7		-22	34.8			285	19.3		-20	30.2			272	46.9		-17	22.4			261	1.2		-13	27.8			249	57.4		-9	2.3		
19 0	317	12.8	288.4	-23	22.6	0.1		303	24.4	288.7	-22	33.6	1.3		290	8.5	289.3	-20	27.9	2.2		277	36.8	289.9	-17	19.4	3.0		265	51.8	290.5	-13	24.3	3.5		254	48.4	291.0	-8	58.5	3.9	
20	322	1.1		-23	22.5			308	13.0		-22	32.3			294	57.8		-20	25.7			282	26.7		-17	16.4			270	42.3		-13	20.8			259	39.5		-8	54.6		
40	326	49.5		-23	22.3			313	1.7		-22	31.1			299	47.0		-20	23.5			287	16.6		-17	13.4			275	32.8		-13	17.2			264	30.5		-8	50.8		
20 0	331	37.8	288.4	-23	22.2	0.2		317	50.4	288.7	-22	29.8	1.3		304	36.3	289.3	-20	21.2	2.3		292	6.5	289.9	-17	10.4	3.0		280	23.3	290.6	-13	13.7	3.5		269	21.6	291.1	-8	46.9	3.8	
20	336	26.2		-23	22.0			322	39.1		-22	28.5			309	25.5		-20	19.0			296	56.4		-17	7.4			285	13.9		-13	10.2			274	12.6		-8	43.1		
40	341	14.6		-23	21.9			327	27.9		-22	27.2			314	14.8		-20	16.7			301	46.4		-17	4.4			290	4.4		-13	6.6			279	3.7		-8	39.2		
21 0	346	2.9	288.4	-23	21.7	0.2		332	16.6	288.7	-22	25.9	1.4		319	4.1	289.3	-20	14.4	2.3		306	36.3	290.0	-17	1.4	3.1		294	55.0	290.6	-13	3.1	3.6		283	54.8	291.1	-8	35.4	3.9	
20	350	51.3		-23	21.4			337	5.3		-22	24.5			323	53.4		-20	12.1			311	26.3		-16	58.3			299	45.6		-12	59.5			288	45.8		-8	31.5		
40	355	39.7		-23	21.2			341	54.0		-22	23.2			328	42.7		-20	9.8			316	16.2		-16	55.3			304	36.1		-12	56.0			293	36.9		-8	27.7		
22 0	0	28.1	288.4	-23	21.0	0.3		346	42.8	288.8	-22	21.8	1.4		333	32.0	289.3	-20	7.5	2.3		321	6.2	290.0	-16	52.2	3.1		309	26.7	290.6	-12	52.4	3.6		298	28.0	291.1	-8	23.8	3.9	
20	5	16.4		-23	20.7			351	31.5		-22	20.4			338	21.3		-20	5.2			325	56.1		-16	49.2			314	17.3		-12	48.9			303	19.1		-8	19.9		
40	10	4.8		-23	20.4			356	20.3		-22	19.0			343	10.6		-20	2.8			330	46.1		-16	46.1			319	7.9		-12	45.3			308	10.2		-8	16.1		
23 0	14	53.2	288.4	-23	20.2	0.3		1	9.0	288.8	-22	17.6	1.4		347	60.0	289.4	-20	0.5	2.4		335	36.1	290.0	-16	43.0	3.1		323	58.5	290.6	-12	41.7	3.6		313	1.3	291.1	-8	12.2	3.9	
20	19	41.6		-23	19.8			5	57.8		-22	16.2			352	49.3		-19	58.1			340	26.1		-16	39.9			328	49.1		-12	38.1			317	52.4		-8	8.3		
40	24	30.0		-23	19.5			10	46.6		-22	14.8			357	38.7		-19	55.7			345	16.1		-16	36.8			333	39.7		-12	34.5			322	43.5		-8	4.5		

2011 Moon

	18 Jul						19 Jul						20 Jul						21 Jul						22 Jul						23 Jul					
	GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec		
h m	°	′	d	°	′	d′	°	′	d	°	′	d′	°	′	d	°	′	d′	°	′	d	°	′	d′	°	′	d	°	′	d′	°	′	d	°	′	d′
0 0	327	34.7	291.1	-8	0.6		317	8.9	291.5	-3	16.3		307	1.3	291.6	1	30.6		296	59.4	291.6	6	10.4		286	50.9	291.4	10	34.6		276	24.3	291.1	14	34.6	
20	332	25.8		-7	56.7	3.9	322	0.4		-3	12.3	4.0	311	53.0		1	34.6	4.0	301	51.0		6	14.2	3.8	291	42.3		10	38.1	3.5	281	15.4		14	37.7	3.1
40	337	16.9		-7	52.8		326	51.9		-3	8.3		316	44.6		1	38.5		306	42.6		6	18.0		296	33.8		10	41.6		286	6.5		14	40.9	
1 0	342	8.1	291.2	-7	48.9		331	43.4	291.5	-3	4.3		321	36.2	291.6	1	42.5		311	34.3	291.6	6	21.8		301	25.2	291.4	10	45.1		290	57.6	291.1	14	44.0	
20	346	59.2		-7	45.0	3.9	336	34.8		-3	0.3	4.0	326	27.9		1	46.4	3.9	316	25.9		6	25.6	3.8	306	16.6		10	48.6	3.5	295	48.7		14	47.1	3.1
40	351	50.4		-7	41.1		341	26.3		-2	56.3		331	19.5		1	50.4		321	17.5		6	29.4		311	8.1		10	52.1		300	39.8		14	50.2	
2 0	356	41.5	291.2	-7	37.2		346	17.8	291.5	-2	52.3		336	11.1	291.6	1	54.3		326	9.1	291.6	6	33.2		315	59.5	291.4	10	55.6		305	30.9	291.1	14	53.3	
20	1	32.7		-7	33.3	3.9	351	9.3		-2	48.3	4.0	341	2.8		1	58.3	4.0	331	0.7		6	36.9	3.8	320	50.9		10	59.1	3.5	310	22.0		14	56.3	3.1
40	6	23.9		-7	29.4		356	0.8		-2	44.3		345	54.4		2	2.2		335	52.3		6	40.7		325	42.4		11	2.6		315	13.1		14	59.4	
3 0	11	15.0	291.2	-7	25.5		0	52.3	291.5	-2	40.3		350	46.0	291.6	2	6.2		340	43.9	291.6	6	44.5		330	33.8	291.4	11	6.1		320	4.2	291.1	15	2.5	
20	16	6.2		-7	21.6	3.9	5	43.8		-2	36.3	4.0	355	37.7		2	10.1	3.9	345	35.5		6	48.3	3.8	335	25.2		11	9.6	3.5	324	55.2		15	5.6	3.1
40	20	57.4		-7	17.7		10	35.3		-2	32.4		0	29.3		2	14.0		350	27.2		6	52.0		340	16.6		11	13.0		329	46.3		15	8.6	
4 0	25	48.6	291.2	-7	13.8		15	26.8	291.5	-2	28.4		5	21.0	291.6	2	18.0		355	18.8	291.6	6	55.8		345	8.0	291.4	11	16.5		334	37.4	291.0	15	11.7	
20	30	39.8		-7	9.9	3.9	20	18.3		-2	24.4	4.0	10	12.6		2	21.9	3.9	0	10.4		6	59.5	3.7	349	59.4		11	20.0	3.5	339	28.4		15	14.7	3.0
40	35	31.0		-7	6.0		25	9.8		-2	20.4		15	4.2		2	25.8		5	2.0		7	3.3		354	50.8		11	23.4		344	19.5		15	17.7	
5 0	40	22.2	291.2	-7	2.1		30	1.3	291.5	-2	16.4		19	55.9	291.6	2	29.8		9	53.6	291.6	7	7.0		359	42.2	291.4	11	26.9		349	10.5	291.0	15	20.8	
20	45	13.4		-6	58.2	3.9	34	52.8		-2	12.4	4.0	24	47.5		2	33.7	3.9	14	45.2		7	10.8	3.8	4	33.6		11	30.3	3.4	354	1.5		15	23.8	3.0
40	50	4.6		-6	54.2		39	44.3		-2	8.4		29	39.2		2	37.6		19	36.8		7	14.5		9	25.0		11	33.8		358	52.6		15	26.8	
6 0	54	55.9	291.2	-6	50.3		44	35.8	291.5	-2	4.4		34	30.8	291.6	2	41.6		24	28.4	291.6	7	18.3		14	16.3	291.4	11	37.2		3	43.6	291.0	15	29.8	
20	59	47.1		-6	46.4	3.9	49	27.4		-2	0.4	4.0	39	22.4		2	45.5	3.9	29	19.9		7	22.0	3.7	19	7.7		11	40.6	3.4	8	34.6		15	32.8	3.0
40	64	38.3		-6	42.5		54	18.9		-1	56.4		44	14.1		2	49.4		34	11.5		7	25.7		23	59.1		11	44.1		13	25.6		15	35.8	
7 0	69	29.6	291.3	-6	38.5		59	10.4	291.5	-1	52.4		49	5.7	291.6	2	53.3		39	3.1	291.6	7	29.5		28	50.5	291.4	11	47.5		18	16.6	291.0	15	38.8	
20	74	20.8		-6	34.6	3.9	64	1.9		-1	48.4	4.0	53	57.4		2	57.3	3.9	43	54.7		7	33.2	3.7	33	41.8		11	50.9	3.4	23	7.6		15	41.8	3.0
40	79	12.1		-6	30.7		68	53.5		-1	44.4		58	49.0		3	1.2		48	46.3		7	36.9		38	33.2		11	54.3		27	58.6		15	44.8	
8 0	84	3.3	291.3	-6	26.8		73	45.0	291.5	-1	40.4		63	40.7	291.6	3	5.1		53	37.9	291.6	7	40.6		43	24.6	291.3	11	57.7		32	49.6	291.0	15	47.7	
20	88	54.6		-6	22.8	4.0	78	36.6		-1	36.4	4.0	68	32.3		3	9.0	3.9	58	29.5		7	44.4	3.7	48	15.9		12	1.1	3.4	37	40.6		15	50.7	3.0
40	93	45.9		-6	18.9		83	28.1		-1	32.4		73	24.0		3	12.9		63	21.0		7	48.1		53	7.3		12	4.5		42	31.6		15	53.6	
9 0	98	37.1	291.3	-6	14.9		88	19.6	291.5	-1	28.4		78	15.6	291.6	3	16.8		68	12.6	291.6	7	51.8		57	58.6	291.3	12	7.9		47	22.5	291.0	15	56.6	
20	103	28.4		-6	11.0	3.9	93	11.2		-1	24.5	4.0	83	7.3		3	20.8	3.9	73	4.2		7	55.5	3.7	62	49.9		12	11.3	3.4	52	13.5		15	59.5	2.9
40	108	19.7		-6	7.1		98	2.7		-1	20.5		87	58.9		3	24.7		77	55.8		7	59.2		67	41.3		12	14.7		57	4.5		16	2.5	
10 0	113	11.0	291.3	-6	3.1		102	54.3	291.6	-1	16.5		92	50.6	291.6	3	28.6		82	47.3	291.6	8	2.9		72	32.6	291.3	12	18.0		61	55.4	290.9	16	5.4	
20	118	2.3		-5	59.2	3.9	107	45.8		-1	12.5	4.0	97	42.2		3	32.5	3.9	87	38.9		8	6.6	3.7	77	23.9		12	21.4	3.4	66	46.4		16	8.3	2.9
40	122	53.5		-5	55.2		112	37.4		-1	8.5		102	33.8		3	36.4		92	30.5		8	10.3		82	15.3		12	24.8		71	37.3		16	11.2	
11 0	127	44.9	291.3	-5	51.3		117	29.0	291.6	-1	4.5		107	25.5	291.6	3	40.3		97	22.0	291.6	8	14.0		87	6.6	291.3	12	28.1		76	28.2	290.9	16	14.1	
20	132	36.2		-5	47.3	4.0	122	20.5		-1	0.5	4.0	112	17.1		3	44.2	3.9	102	13.6		8	17.6	3.7	91	57.9		12	31.5	3.4	81	19.2		16	17.0	2.9
40	137	27.5		-5	43.4		127	12.1		-0	56.5		117	8.8		3	48.1		107	5.1		8	21.3		96	49.2		12	34.8		86	10.1		16	19.9	
12 0	142	18.8	291.3	-5	39.4		132	3.7	291.6	-0	52.5		122	0.4	291.6	3	52.0		111	56.7	291.6	8	25.0		101	40.5	291.3	12	38.2		91	1.0	290.9	16	22.8	
20	147	10.1		-5	35.4	4.0	136	55.2		-0	48.5	4.0	126	52.1		3	55.8	3.9	116	48.3		8	28.7	3.7	106	31.8		12	41.5	3.3	95	51.9		16	25.7	2.9
40	152	1.4		-5	31.5		141	46.8		-0	44.5		131	43.7		3	59.7		121	39.8		8	32.3		111	23.1		12	44.8		100	42.8		16	28.5	
13 0	156	52.7	291.3	-5	27.5		146	38.4	291.6	-0	40.6		136	35.4	291.6	4	3.6		126	31.4	291.5	8	36.0		116	14.4	291.3	12	48.2		105	33.7	290.9	16	31.4	
20	161	44.1		-5	23.6	4.0	151	29.9		-0	36.6	4.0	141	27.0		4	7.5	3.9	131	22.9		8	39.7	3.7	121	5.7		12	51.5	3.3	110	24.6		16	34.2	2.8
40	166	35.4		-5	19.6		156	21.5		-0	32.6		146	18.7		4	11.4		136	14.4		8	43.3		125	57.0		12	54.8		115	15.5		16	37.1	
14 0	171	26.8	291.3	-5	15.6		161	13.1	291.6	-0	28.6		151	10.3	291.6	4	15.3		141	6.0	291.5	8	47.0		130	48.2	291.3	12	58.1		120	6.4	290.9	16	39.9	
20	176	18.1		-5	11.7	3.9	166	4.7		-0	24.6	4.0	156	2.0		4	19.1	3.9	145	57.5		8	50.6	3.6	135	39.5		13	1.4	3.3	124	57.2		16	42.8	2.8
40	181	9.5		-5	7.7		170	56.3		-0	20.6		160	53.6		4	23.0		150	49.1		8	54.3		140	30.8		13	4.7		129	48.1		16	45.6	
15 0	186	0.8	291.4	-5	3.8		175	47.9	291.6	-0	16.6		165	45.2	291.6	4	26.9		155	40.6	291.5	8	57.9		145	22.1	291.3	13	8.0		134	38.9	290.8	16	48.4	
20	190	52.2		-4	59.8	4.0	180	39.4		-0	12.6	4.0	170	36.9		4	30.8	3.9	160	32.1		9	1.5	3.6	150	13.3		13	11.3	3.3	139	29.8		16	51.2	2.8
40	195	43.5		-4	55.8		185	31.0		-0	8.7		175	28.5		4	34.6		165	23.7		9	5.2		155	4.6		13	14.6		144	20.6		16	54.0	
16 0	200	34.9	291.4	-4	51.8		190	22.6	291.6	-0	4.7		180	20.2	291.6	4	38.5		170	15.2	291.5	9	8.8		159	55.8	291.2	13	17.8		149	11.5	290.8	16	56.8	
20	205	26.3		-4	47.9	4.0	195	14.2		-0	0.7	4.0	185	11.8		4	42.3	3.9	175	6.7		9	12.4	3.6	164	47.1		13	21.1	3.3	154	2.3		16	59.6	2.8
40	210	17.7		-4	43.9		200	5.8		0	3.3		190	3.5		4	46.2		179	58.2		9	16.0		169	38.3		13	24.4		158	53.1		17	2.4	
17 0	215	9.0	291.4	-4	39.9		204	57.4	291.6	0	7.3		194	55.1	291.6	4	50.1		184	49.7	291.5	9	19.7		174	29.5	291.2	13	27.6		163	44.0	290.8	17	5.1	
20	220	0.4		-4	35.9	4.0	209	49.0		0	11.2	4.0	199	46.7		4	53.9	3.8	189	41.3		9	23.3	3.6	179	20.8		13	30.9	3.3	168	34.8		17	7.9	2.8
40	224	51.8		-4	32.0		214	40.6		0	15.2		204	38.4		4	57.8		194	32.8		9	26.9		184	12.0		13	34.1		173	25.6		17	10.6	
18 0	229	43.2	291.4	-4	28.0		219	32.2	291.6	0	19.2		209	30.0	291.6	5	1.6		199	24.3	291.5	9	30.5		189	3.2	291.2	13	37.4		178	16.4	290.8	17	13.4	
20	234	34.6		-4	24.0	4.0	224	23.8		0	23.2	4.0	214	21.7		5	5.5	3.9	204	15.8		9	34.1	3.6	193	54.4		13	40.6	3.2	183	7.2		17	16.1	2.7
40	239	26.0		-4	20.0		229	15.4		0	27.1		219	13.3		5	9.3		209	7.3		9	37.7		198	45.6		13	43.8		187	58.0		17	18.9	
19 0	244	17.4	291.4	-4	16.1		234	7.0	291.6	0	31.1		224	4.9	291.6	5	13.2		213	58.8	291.5	9	41.3		203	36.8	291.2	13	47.0		192	48.7	290.8	17	21.6	
20	249	8.8		-4	12.1	4.0	238	58.7		0	35.1	4.0	228	56.6		5	17.0	3.8	218	50.3		9	44.9	3.6	208	28.0		13	50.3	3.2	197	39.5		17	24.3	2.7
40	254	0.2		-4	8.1		243	50.3		0	39.1		233	48.2		5	20.8		223	41.8		9	48.4		213	19.2		13	53.5		202	30.3		17	27.0	
20 0	258	51.6	291.4	-4	4.1		248	41.9	291.6	0	43.0		238	39.8	291.6	5	24.7		228	33.3	291.5	9	52.0		218	10.4	291.2	13	56.7		207	21.0	290.7	17	29.7	
20	263	43.1		-4	0.1	4.0	253	33.5		0	47.0	4.0	243	31.5		5	28.5	3.8	233	24.7		9	55.6	3.6	223	1.6		13	59.9	3.2	212	11.8		17	32.4	2.7
40	268	34.5		-3	56.1		258	25.1		0	51.0		248	23.1		5	32.3		238	16.2		9	59.2		227	52.8		14	3.1		217	2.5		17	35.1	
21 0	273	25.9	291.4	-3	52.2		263	16.7	291.6	0	54.9		253	14.8	291.6	5	36.1		243	7.7	291.5	10	2.7		232	44.0	291.2	14	6.2		221	53.3	290.7	17	37.8	
20	278	17.4		-3	48.2	4.0	268	8.3		0	58.9	4.0	258	6.4		5	40.0	3.8	247	59.2		10	6.3	3.6	237	35.1		14	9.4	3.2	226	44.0		17	40.4	2.6
40	283	8.8		-3	44.2		272	60.0		1	2.9		262	58.0		5	43.8		252	50.7		10	9.8		242	26.3		14	12.6		231	34.7		17	43.1	
22 0	288	0.2	291.4	-3	40.2		277	51.6	291.6	1	6.8		267	49.6	291.6	5	47.6		257	42.1	291.5	10	13.4		247	17.5	291.1	14	15.8		236	25.5	290.7	17	45.7	
20	292	51.7		-3	36.2	4.0	282	43.2		1	10.8	4.0	272	41.3		5	51.4	3.8	262	33.6		10	16.9	3.5	252	8.6		14	18.9	3.1	241	16.2		17	48.4	2.6
40	297	43.1		-3	32.2		287	34.8		1	14.8		277	32.9		5	55.2		267	25.1		10	20.5		256	59.8		14	22.1		246	6.9		17	51.0	
23 0	302	34.6	291.5	-3	28.2		292	26.5	291.6	1	18.7		282	24.5	291.6	5	59.0		272	16.5	291.5	10	24.0		261	50.9	291.1	14	25.2		250	57.6	290.7	17	53.6	
20	307	26.0		-3	24.2	4.0	297	18.1		1	22.7	4.0	287	16.1		6	2.8	3.8	277	8.0		10	27.5	3.5	266	42.0		14	28.4	3.1	255	48.3		17	56.2	2.6
40	312	17.5		-3	20.3		302	9.7		1	26.6		292	7.8		6	6.6		281	59.4		10	31.1		271	33.2		14	31.5		260	38.9		17	58.9	

2011 Moon

	24 Jul						25 Jul						26 Jul						27 Jul						28 Jul						29 Jul					
	GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec		
h m	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'
0 0	265	29.6	290.7	18	1.5	2.6	253	59.7	290.1	20	45.1	1.9	241	51.7	289.6	22	34.6	1.1	229	9.1	289.2	23	19.4	0.1	216	1.5	288.9	22	51.0	-0.9	202	43.3	288.9	21	5.4	-2.0
20	270	20.3		18	4.1		258	49.8		20	47.0		246	41.3		22	35.7		233	58.3		23	19.6		220	50.5		22	50.1		207	32.2		21	3.4	
40	275	11.0		18	6.6		263	40.0		20	48.9		251	31.0		22	36.8		238	47.5		23	19.7		225	39.4		22	49.1		212	21.1		21	1.3	
1 0	280	1.6	290.6	18	9.2	2.6	268	30.1	290.1	20	50.8	1.9	256	20.6	289.6	22	37.8	1.1	243	36.7	289.2	23	19.8	0.1	230	28.4	288.9	22	48.2	-1.0	217	10.0	288.9	20	59.3	-2.1
20	284	52.3		18	11.8		273	20.2		20	52.7		261	10.2		22	38.9		248	25.9		23	19.8		235	17.3		22	47.2		221	58.9		20	57.2	
40	289	42.9		18	14.3		278	10.4		20	54.6		265	59.8		22	39.9		253	15.0		23	19.9		240	6.3		22	46.2		226	47.8		20	55.2	
2 0	294	33.5	290.6	18	16.9	2.5	283	0.5	290.1	20	56.4	1.8	270	49.4	289.6	22	41.0	1.0	258	4.2	289.2	23	20.0	0.0	244	55.2	288.9	22	45.2	-1.0	231	36.7	288.9	20	53.1	-2.1
20	299	24.2		18	19.4		287	50.6		20	58.3		275	39.0		22	42.0		262	53.4		23	20.0		249	44.1		22	44.2		236	25.7		20	51.0	
40	304	14.8		18	22.0		292	40.7		21	0.1		280	28.6		22	43.0		267	42.6		23	20.0		254	33.1		22	43.1		241	14.6		20	48.9	
3 0	309	5.4	290.6	18	24.5	2.5	297	30.8	290.1	21	1.9	1.8	285	18.1	289.6	22	44.0	0.9	272	31.7	289.2	23	20.0	0.0	259	22.0	288.9	22	42.1	-1.1	246	3.5	288.9	20	46.8	-2.2
20	313	56.0		18	27.0		302	20.8		21	3.8		290	7.7		22	44.9		277	20.9		23	20.0		264	11.0		22	41.0		250	52.4		20	44.6	
40	318	46.6		18	29.5		307	10.9		21	5.6		294	57.3		22	45.9		282	10.0		23	20.0		268	59.9		22	39.9		255	41.3		20	42.5	
4 0	323	37.2	290.6	18	32.0	2.5	312	1.0	290.1	21	7.4	1.8	299	46.8	289.5	22	46.8	0.9	286	59.2	289.1	23	20.0	-0.1	273	48.8	288.9	22	38.8	-1.1	260	30.2	288.9	20	40.3	-2.2
20	328	27.8		18	34.5		316	51.0		21	9.2		304	36.4		22	47.8		291	48.3		23	19.9		278	37.7		22	37.7		265	19.2		20	38.1	
40	333	18.4		18	37.0		321	41.1		21	10.9		309	25.9		22	48.7		296	37.5		23	19.8		283	26.7		22	36.6		270	8.1		20	35.9	
5 0	338	9.0	290.6	18	39.5	2.4	326	31.1	290.0	21	12.7	1.8	314	15.5	289.5	22	49.6	0.9	301	26.6	289.1	23	19.8	-0.1	288	15.6	288.9	22	35.4	-1.2	274	57.0	288.9	20	33.7	-2.2
20	342	59.5		18	41.9		331	21.2		21	14.5		319	5.0		22	50.5		306	15.8		23	19.7		293	4.5		22	34.3		279	45.9		20	31.5	
40	347	50.1		18	44.4		336	11.2		21	16.2		323	54.5		22	51.4		311	4.9		23	19.6		297	53.4		22	33.1		284	34.9		20	29.2	
6 0	352	40.6	290.5	18	46.8	2.4	341	1.2	290.0	21	18.0	1.7	328	44.0	289.5	22	52.3	0.8	315	54.0	289.1	23	19.4	-0.1	302	42.4	288.9	22	31.9	-1.2	289	23.8	288.9	20	27.0	-2.3
20	357	31.2		18	49.3		345	51.3		21	19.7		333	33.5		22	53.1		320	43.1		23	19.3		307	31.3		22	30.7		294	12.7		20	24.7	
40	2	21.7		18	51.7		350	41.3		21	21.4		338	23.0		22	54.0		325	32.3		23	19.2		312	20.2		22	29.5		299	1.6		20	22.4	
7 0	7	12.3	290.5	18	54.1	2.4	355	31.3	290.0	21	23.1	1.7	343	12.5	289.5	22	54.8	0.8	330	21.4	289.1	23	19.0	-0.2	317	9.1	288.9	22	28.2	-1.3	303	50.6	288.9	20	20.1	-2.3
20	12	2.8		18	56.5		0	21.3		21	24.8		348	2.0		22	55.6		335	10.5		23	18.8		321	58.0		22	27.0		308	39.5		20	17.8	
40	16	53.3		18	58.9		5	11.2		21	26.5		352	51.5		22	56.4		339	59.6		23	18.6		326	47.0		22	25.7		313	28.4		20	15.5	
8 0	21	43.8	290.5	19	1.3	2.4	10	1.2	290.0	21	28.1	1.7	357	41.0	289.5	22	57.2	0.8	344	48.7	289.1	23	18.4	-0.2	331	35.9	288.9	22	24.4	-1.3	318	17.4	288.9	20	13.2	-2.4
20	26	34.3		19	3.7		14	51.2		21	29.8		2	30.5		22	58.0		349	37.8		23	18.2		336	24.8		22	23.1		323	6.3		20	10.8	
40	31	24.8		19	6.1		19	41.2		21	31.4		7	19.9		22	58.8		354	26.9		23	18.0		341	13.7		22	21.8		327	55.3		20	8.4	
9 0	36	15.3	290.5	19	8.5	2.3	24	31.1	289.9	21	33.1	1.6	12	9.4	289.4	22	59.5	0.7	359	16.0	289.1	23	17.7	-0.3	346	2.6	288.9	22	20.5	-1.4	332	44.2	288.9	20	6.0	-2.4
20	41	5.8		19	10.8		29	21.1		21	34.7		16	58.9		23	0.3		4	5.0		23	17.4		350	51.5		22	19.2		337	33.1		20	3.6	
40	45	56.2		19	13.2		34	11.0		21	36.3		21	48.3		23	1.0		8	54.1		23	17.2		355	40.4		22	17.8		342	22.1		20	1.2	
10 0	50	46.7	290.5	19	15.5	2.3	39	0.9	289.9	21	37.9	1.6	26	37.7	289.4	23	1.7	0.7	13	43.2	289.1	23	16.9	-0.3	0	29.3	288.9	22	16.4	-1.4	347	11.0	289.0	19	58.8	-2.4
20	55	37.2		19	17.8		43	50.9		21	39.5		31	27.2		23	2.4		18	32.3		23	16.5		5	18.3		22	15.0		351	60.0		19	56.4	
40	60	27.6		19	20.1		48	40.8		21	41.1		36	16.6		23	3.1		23	21.3		23	16.2		10	7.2		22	13.6		356	48.9		19	53.9	
11 0	65	18.1	290.4	19	22.5	2.3	53	30.7	289.9	21	42.7	1.5	41	6.0	289.4	23	3.8	0.6	28	10.4	289.1	23	15.9	-0.4	14	56.1	288.9	22	12.2	-1.4	1	37.9	289.0	19	51.5	-2.5
20	70	8.5		19	24.8		58	20.6		21	44.2		45	55.4		23	4.4		32	59.5		23	15.5		19	45.0		22	10.8		6	26.8		19	49.0	
40	74	58.9		19	27.1		63	10.5		21	45.8		50	44.9		23	5.1		37	48.5		23	15.2		24	33.9		22	9.3		11	15.8		19	46.5	
12 0	79	49.4	290.4	19	29.3	2.3	68	0.4	289.9	21	47.3	1.5	55	34.3	289.4	23	5.7	0.6	42	37.6	289.0	23	14.8	-0.4	29	22.8	288.9	22	7.9	-1.5	16	4.8	289.0	19	44.0	-2.5
20	84	39.8		19	31.6		72	50.3		21	48.8		60	23.7		23	6.3		47	26.6		23	14.4		34	11.7		22	6.4		20	53.7		19	41.4	
40	89	30.2		19	33.9		77	40.2		21	50.3		65	13.1		23	6.9		52	15.7		23	14.0		39	0.6		22	4.9		25	42.7		19	38.9	
13 0	94	20.6	290.4	19	36.1	2.2	82	30.0	289.9	21	51.8	1.5	70	2.4	289.4	23	7.5	0.6	57	4.7	289.0	23	13.5	-0.4	43	49.5	288.9	22	3.4	-1.5	30	31.6	289.0	19	36.4	-2.6
20	99	11.0		19	38.4		87	19.9		21	53.3		74	51.8		23	8.1		61	53.8		23	13.1		48	38.4		22	1.9		35	20.6		19	33.8	
40	104	1.4		19	40.6		92	9.7		21	54.8		79	41.2		23	8.7		66	42.8		23	12.6		53	27.3		22	0.4		40	9.6		19	31.2	
14 0	108	51.7	290.4	19	42.8	2.2	96	59.6	289.8	21	56.2	1.5	84	30.6	289.4	23	9.2	0.5	71	31.8	289.0	23	12.2	-0.5	58	16.2	288.9	21	58.8	-1.6	44	58.5	289.0	19	28.6	-2.6
20	113	42.1		19	45.1		101	49.4		21	57.7		89	19.9		23	9.8		76	20.9		23	11.7		63	5.1		21	57.2		49	47.5		19	26.0	
40	118	32.5		19	47.3		106	39.3		21	59.1		94	9.3		23	10.3		81	9.9		23	11.2		67	54.0		21	55.7		54	36.5		19	23.4	
15 0	123	22.8	290.3	19	49.5	2.2	111	29.1	289.8	22	0.6	1.4	98	58.6	289.3	23	10.8	0.5	85	58.9	289.0	23	10.6	-0.5	72	42.9	288.9	21	54.1	-1.6	59	25.5	289.0	19	20.8	-2.7
20	128	13.2		19	51.6		116	18.9		22	2.0		103	48.0		23	11.3		90	48.0		23	10.1		77	31.8		21	52.4		64	14.4		19	18.1	
40	133	3.5		19	53.8		121	8.7		22	3.4		108	37.3		23	11.8		95	37.0		23	9.6		82	20.7		21	50.8		69	3.4		19	15.5	
16 0	137	53.9	290.3	19	56.0	2.1	125	58.5	289.8	22	4.8	1.4	113	26.7	289.3	23	12.3	0.4	100	26.0	289.0	23	9.0	-0.6	87	9.6	288.9	21	49.2	-1.7	73	52.4	289.0	19	12.8	-2.7
20	142	44.2		19	58.2		130	48.3		22	6.2		118	16.0		23	12.7		105	15.0		23	8.4		91	58.5		21	47.5		78	41.4		19	10.1	
40	147	34.5		20	0.3		135	38.1		22	7.5		123	5.3		23	13.2		110	4.0		23	7.8		96	47.4		21	45.9		83	30.4		19	7.4	
17 0	152	24.8	290.3	20	2.4	2.1	140	27.9	289.8	22	8.9	1.3	127	54.6	289.3	23	13.6	0.4	114	53.0	289.0	23	7.2	-0.6	101	36.3	288.9	21	44.2	-1.7	88	19.4	289.0	19	4.7	-2.7
20	157	15.1		20	4.6		145	17.7		22	10.2		132	43.9		23	14.0		119	42.0		23	6.6		106	25.2		21	42.5		93	8.4		19	2.0	
40	162	5.4		20	6.7		150	7.4		22	11.6		137	33.2		23	14.4		124	31.0		23	6.0		111	14.1		21	40.8		97	57.4		18	59.2	
18 0	166	55.7	290.3	20	8.8	2.1	154	57.2	289.7	22	12.9	1.3	142	22.6	289.3	23	14.8	0.4	129	20.0	289.0	23	5.3	-0.7	116	3.0	288.9	21	39.0	-1.8	102	46.4	289.0	18	56.5	-2.8
20	171	46.0		20	10.9		159	47.0		22	14.2		147	11.8		23	15.2		134	9.0		23	4.7		120	51.9		21	37.3		107	35.4		18	53.7	
40	176	36.3		20	13.0		164	36.7		22	15.5		152	1.1		23	15.6		138	58.0		23	4.0		125	40.8		21	35.5		112	24.4		18	50.9	
19 0	181	26.5	290.3	20	15.1	2.1	169	26.4	289.7	22	16.8	1.3	156	50.4	289.3	23	15.9	0.3	143	47.0	289.0	23	3.3	-0.7	130	29.7	288.9	21	33.7	-1.8	117	13.4	289.0	18	48.1	-2.8
20	186	16.8		20	17.1		174	16.2		22	18.1		161	39.7		23	16.2		148	36.0		23	2.6		135	18.6		21	32.0		122	2.4		18	45.3	
40	191	7.1		20	19.2		179	5.9		22	19.3		166	29.0		23	16.6		153	25.0		23	1.8		140	7.5		21	30.2		126	51.4		18	42.5	
20 0	195	57.3	290.2	20	21.3	2.0	183	55.6	289.7	22	20.6	1.2	171	18.2	289.3	23	16.9	0.3	158	13.9	289.0	23	1.1	-0.8	144	56.4	288.9	21	28.3	-1.8	131	40.4	289.0	18	39.7	-2.9
20	200	47.5		20	23.3		188	45.3		22	21.8		176	7.5		23	17.2		163	2.9		23	0.3		149	45.3		21	26.5		136	29.4		18	36.8	
40	205	37.8		20	25.3		193	35.0		22	23.0		180	56.8		23	17.4		167	51.9		22	59.6		154	34.2		21	24.7		141	18.4		18	33.9	
21 0	210	28.0	290.2	20	27.4	2.0	198	24.7	289.7	22	24.2	1.2	185	46.0	289.2	23	17.7	0.2	172	40.9	289.0	22	58.8	-0.8	159	23.1	288.9	21	22.8	-1.9	146	7.4	289.0	18	31.1	-2.9
20	215	18.2		20	29.4		203	14.4		22	25.4		190	35.3		23	17.9		177	29.8		22	58.0		164	12.0		21	20.9		150	56.5		18	28.2	
40	220	8.4		20	31.4		208	4.1		22	26.6		195	24.5		23	18.2		182	18.8		22	57.2		169	0.9		21	19.0		155	45.5		18	25.3	
22 0	224	58.6	290.2	20	33.4	2.0	212	53.8	289.7	22	27.8	1.2	200	13.8	289.2	23	18.4	0.2	187	7.8	289.0	22	56.3	-0.8	173	49.8	288.9	21	17.1	-1.9	160	34.5	289.0	18	22.4	-2.9
20	229	48.8		20	35.3		217	43.5		22	29.0		205	3.0		23	18.6		191	56.7		22	55.5		178	38.7		21	15.2		165	23.5		18	19.4	
40	234	39.0		20	37.3		222	33.1		22	30.1		209	52.2		23	18.8		196	45.7		22	54.6		183	27.6		21	13.3		170	12.6		18	16.5	
23 0	239	29.2	290.2	20	39.3	1.9	227	22.8	289.6	22	31.3	1.1	214	41.4	289.2	23	19.0	0.1	201	34.7	289.0	22	53.8	-0.9	188	16.5	288.9	21	11.3	-2.0	175	1.6	289.0	18	13.6	-3.0
20	244	19.4		20	41.2		232	12.4		22	32.4		219	30.7		23	19.1		206	23.6		22	52.9		193	5.5		21	9.3		179	50.6		18	10.6	
40	249	9.5		20	43.1		237	2.1		22	33.5		224	19.9		23	19.3		211	12.6		22	52.0		197	54.4		21	7.4		184	39.7		18	7.6	

2011 Moon

	30 Jul					31 Jul					1 Aug					2 Aug					3 Aug					4 Aug				
	GHA			Dec		GHA			Dec		GHA			Dec		GHA			Dec		GHA			Dec		GHA			Dec	
h m	o	'	d	o	'	o	'	d	o	'	o	'	d	o	'	o	'	d	o	'	o	'	d	o	'	o	'	d	o	'
0 0	189	28.7	289.0	18	4.6	176	28.1	289.3	13	57.7	163	44.9	289.5	8	59.2	151	15.8	289.7	3	27.7	138	52.7	289.7	-2	16.3	126	25.2	289.5	-7	52.1
20	194	17.8		18	1.6	181	17.4		13	53.9	168	34.4		8	54.8	156	5.4		3	23.0	143	42.4		-2	21.1	131	14.7		-7	56.6
40	199	6.8		17	58.6	186	6.7		13	50.0	173	23.9		8	50.4	160	55.1		3	18.2	148	32.1		-2	25.9	136	4.3		-8	1.1
1 0	203	55.9	289.1	17	55.6	190	56.0	289.3	13	46.2	178	13.4	289.5	8	45.9	165	44.8	289.7	3	13.5	153	21.7	289.7	-2	30.6	140	53.8	289.5	-8	5.6
20	208	44.9		17	52.5	195	45.2		13	42.3	183	2.9		8	41.5	170	34.4		3	8.8	158	11.4		-2	35.4	145	43.3		-8	10.1
40	213	34.0		17	49.5	200	34.5		13	38.4	187	52.5		8	37.0	175	24.1		3	4.0	163	1.1		-2	40.2	150	32.8		-8	14.6
2 0	218	23.0	289.1	17	46.4	205	23.8	289.3	13	34.6	192	42.0	289.5	8	32.6	180	13.8	289.7	2	59.2	167	50.7	289.7	-2	44.9	155	22.4	289.5	-8	19.1
20	223	12.1		17	43.3	210	13.1		13	30.7	197	31.5		8	28.1	185	3.4		2	54.5	172	40.4		-2	49.7	160	11.9		-8	23.5
40	228	1.2		17	40.2	215	2.4		13	26.8	202	21.0		8	23.7	189	53.1		2	49.7	177	30.1		-2	54.4	165	1.4		-8	28.0
3 0	232	50.2	289.1	17	37.1	219	51.8	289.3	13	22.9	207	10.6	289.5	8	19.2	194	42.8	289.7	2	45.0	182	19.7	289.7	-2	59.2	169	50.9	289.5	-8	32.5
20	237	39.3		17	34.0	224	41.1		13	18.9	212	0.1		8	14.7	199	32.4		2	40.2	187	9.4		-3	3.9	174	40.4		-8	36.9
40	242	28.4		17	30.9	229	30.4		13	15.0	216	49.7		8	10.2	204	22.1		2	35.5	191	59.1		-3	8.7	179	29.9		-8	41.4
4 0	247	17.5	289.1	17	27.7	234	19.7	289.3	13	11.1	221	39.2	289.5	8	5.7	209	11.8	289.7	2	30.7	196	48.7	289.7	-3	13.4	184	19.4	289.5	-8	45.8
20	252	6.6		17	24.6	239	9.0		13	7.1	226	28.7		8	1.2	214	1.5		2	25.9	201	38.4		-3	18.2	189	8.9		-8	50.2
40	256	55.6		17	21.4	243	58.3		13	3.2	231	18.3		7	56.7	218	51.1		2	21.2	206	28.1		-3	22.9	193	58.4		-8	54.7
5 0	261	44.7	289.1	17	18.2	248	47.7	289.3	12	59.2	236	7.8	289.6	7	52.2	223	40.8	289.7	2	16.4	211	17.7	289.7	-3	27.7	198	47.9	289.5	-8	59.1
20	266	33.8		17	15.0	253	37.0		12	55.2	240	57.4		7	47.7	228	30.5		2	11.6	216	7.4		-3	32.4	203	37.4		-9	3.5
40	271	22.9		17	11.8	258	26.3		12	51.2	245	47.0		7	43.2	233	20.2		2	6.8	220	57.0		-3	37.1	208	26.9		-9	7.9
6 0	276	12.0	289.1	17	8.6	263	15.7	289.3	12	47.2	250	36.5	289.6	7	38.7	238	9.8	289.7	2	2.1	225	46.7	289.7	-3	41.9	213	16.4	289.5	-9	12.3
20	281	1.1		17	5.4	268	5.0		12	43.2	255	26.1		7	34.1	242	59.5		1	57.3	230	36.3		-3	46.6	218	5.9		-9	16.7
40	285	50.2		17	2.1	272	54.4		12	39.2	260	15.6		7	29.6	247	49.2		1	52.5	235	26.0		-3	51.3	222	55.3		-9	21.1
7 0	290	39.3	289.1	16	58.9	277	43.7	289.4	12	35.2	265	5.2	289.6	7	25.1	252	38.9	289.7	1	47.7	240	15.6	289.6	-3	56.0	227	44.8	289.5	-9	25.5
20	295	28.4		16	55.6	282	33.1		12	31.2	269	54.8		7	20.5	257	28.5		1	43.0	245	5.3		-4	0.8	232	34.3		-9	29.9
40	300	17.5		16	52.3	287	22.4		12	27.1	274	44.3		7	16.0	262	18.2		1	38.2	249	54.9		-4	5.5	237	23.7		-9	34.3
8 0	305	6.7	289.1	16	49.0	292	11.8	289.4	12	23.1	279	33.9	289.6	7	11.4	267	7.9	289.7	1	33.4	254	44.6	289.6	-4	10.2	242	13.2	289.5	-9	38.6
20	309	55.8		16	45.7	297	1.2		12	19.0	284	23.5		7	6.9	271	57.6		1	28.6	259	34.2		-4	14.9	247	2.7		-9	43.0
40	314	44.9		16	42.4	301	50.5		12	15.0	289	13.1		7	2.3	276	47.3		1	23.8	264	23.9		-4	19.6	251	52.1		-9	47.3
9 0	319	34.0	289.1	16	39.1	306	39.9	289.4	12	10.9	294	2.6	289.6	6	57.7	281	37.0	289.7	1	19.0	269	13.5	289.6	-4	24.3	256	41.6	289.4	-9	51.7
20	324	23.1		16	35.8	311	29.3		12	6.8	298	52.2		6	53.1	286	26.6		1	14.3	274	3.1		-4	29.0	261	31.0		-9	56.0
40	329	12.3		16	32.4	316	18.6		12	2.7	303	41.8		6	48.6	291	16.3		1	9.5	278	52.8		-4	33.7	266	20.5		-10	0.4
10 0	334	1.4	289.1	16	29.0	321	8.0	289.4	11	58.6	308	31.4	289.6	6	44.0	296	6.0	289.7	1	4.7	283	42.4	289.6	-4	38.4	271	9.9	289.4	-10	4.7
20	338	50.6		16	25.7	325	57.4		11	54.5	313	21.0		6	39.4	300	55.7		0	59.9	288	32.0		-4	43.1	275	59.3		-10	9.0
40	343	39.7		16	22.3	330	46.8		11	50.4	318	10.6		6	34.8	305	45.4		0	55.1	293	21.7		-4	47.8	280	48.8		-10	13.3
11 0	348	28.8	289.2	16	18.9	335	36.2	289.4	11	46.3	323	0.2	289.6	6	30.2	310	35.1	289.7	0	50.3	298	11.3	289.6	-4	52.5	285	38.2	289.4	-10	17.6
20	353	18.0		16	15.5	340	25.6		11	42.1	327	49.8		6	25.6	315	24.7		0	45.5	303	0.9		-4	57.2	290	27.6		-10	21.9
40	358	7.1		16	12.1	345	15.0		11	38.0	332	39.4		6	21.0	320	14.4		0	40.7	307	50.6		-5	1.9	295	17.1		-10	26.2
12 0	2	56.3	289.2	16	8.6	350	4.4	289.4	11	33.8	337	29.0	289.6	6	16.4	325	4.1	289.7	0	36.0	312	40.2	289.6	-5	6.5	300	6.5	289.4	-10	30.5
20	7	45.4		16	5.2	354	53.8		11	29.7	342	18.6		6	11.7	329	53.8		0	31.2	317	29.8		-5	11.2	304	55.9		-10	34.8
40	12	34.6		16	1.7	359	43.2		11	25.5	347	8.2		6	7.1	334	43.5		0	26.4	322	19.4		-5	15.9	309	45.3		-10	39.0
13 0	17	23.8	289.2	15	58.3	4	32.6	289.4	11	21.3	351	57.8	289.6	6	2.5	339	33.2	289.7	0	21.6	327	9.1	289.6	-5	20.6	314	34.7	289.4	-10	43.3
20	22	12.9		15	54.8	9	22.0		11	17.1	356	47.4		5	57.9	344	22.9		0	16.8	331	58.7		-5	25.2	319	24.1		-10	47.5
40	27	2.1		15	51.3	14	11.4		11	12.9	1	37.0		5	53.2	349	12.6		0	12.0	336	48.3		-5	29.9	324	13.5		-10	51.8
14 0	31	51.3	289.2	15	47.8	19	0.8	289.4	11	8.7	6	26.6	289.6	5	48.6	354	2.2	289.7	0	7.2	341	37.9	289.6	-5	34.5	329	2.9	289.4	-10	56.0
20	36	40.5		15	44.3	23	50.3		11	4.5	11	16.2		5	43.9	358	51.9		0	2.4	346	27.5		-5	39.2	333	52.3		-11	0.2
40	41	29.6		15	40.8	28	39.7		11	0.3	16	5.8		5	39.3	3	41.6		-0	2.4	351	17.1		-5	43.8	338	41.7		-11	4.5
15 0	46	18.8	289.2	15	37.2	33	29.1	289.4	10	56.1	20	55.5	289.6	5	34.6	8	31.3	289.7	-0	7.2	356	6.7	289.6	-5	48.5	343	31.1	289.4	-11	8.7
20	51	8.0		15	33.7	38	18.5		10	51.9	25	45.1		5	30.0	13	21.0		-0	12.0	0	56.3		-5	53.1	348	20.5		-11	12.9
40	55	57.2		15	30.1	43	8.0		10	47.6	30	34.7		5	25.3	18	10.7		-0	16.8	5	45.9		-5	57.7	353	9.8		-11	17.1
16 0	60	46.4	289.2	15	26.6	47	57.4	289.4	10	43.4	35	24.3	289.6	5	20.7	23	0.4	289.7	-0	21.5	10	35.5	289.6	-6	2.4	357	59.2	289.4	-11	21.3
20	65	35.6		15	23.0	52	46.9		10	39.1	40	13.9		5	16.0	27	50.0		-0	26.3	15	25.1		-6	7.0	2	48.6		-11	25.4
40	70	24.8		15	19.4	57	36.3		10	34.8	45	3.6		5	11.3	32	39.7		-0	31.1	20	14.7		-6	11.6	7	38.0		-11	29.6
17 0	75	14.0	289.2	15	15.8	62	25.8	289.5	10	30.6	49	53.2	289.6	5	6.6	37	29.4	289.7	-0	35.9	25	4.3	289.6	-6	16.2	12	27.3	289.4	-11	33.8
20	80	3.2		15	12.2	67	15.2		10	26.3	54	42.8		5	2.0	42	19.1		-0	40.7	29	53.9		-6	20.8	17	16.7		-11	37.9
40	84	52.4		15	8.5	72	4.7		10	22.0	59	32.5		4	57.3	47	8.8		-0	45.5	34	43.5		-6	25.5	22	6.0		-11	42.1
18 0	89	41.6	289.2	15	4.9	76	54.1	289.5	10	17.7	64	22.1	289.6	4	52.6	51	58.5	289.7	-0	50.3	39	33.1	289.6	-6	30.1	26	55.4	289.3	-11	46.2
20	94	30.9		15	1.3	81	43.6		10	13.4	69	11.7		4	47.9	56	48.2		-0	55.1	44	22.7		-6	34.7	31	44.7		-11	50.4
40	99	20.1		14	57.6	86	33.0		10	9.1	74	1.4		4	43.2	61	37.8		-0	59.9	49	12.2		-6	39.3	36	34.1		-11	54.5
19 0	104	9.3	289.2	14	53.9	91	22.5	289.5	10	4.8	78	51.0	289.6	4	38.5	66	27.5	289.7	-1	4.7	54	1.8	289.6	-6	43.8	41	23.4	289.3	-11	58.6
20	108	58.5		14	50.3	96	12.0		10	0.5	83	40.7		4	33.8	71	17.2		-1	9.4	58	51.4		-6	48.4	46	12.7		-12	2.7
40	113	47.8		14	46.6	101	1.5		9	56.1	88	30.3		4	29.1	76	6.9		-1	14.2	63	41.0		-6	53.0	51	2.1		-12	6.8
20 0	118	37.0	289.2	14	42.9	105	50.9	289.5	9	51.8	93	19.9	289.6	4	24.4	80	56.6	289.7	-1	19.0	68	30.5	289.6	-6	57.6	55	51.4	289.3	-12	10.9
20	123	26.2		14	39.2	110	40.4		9	47.5	98	9.6		4	19.7	85	46.3		-1	23.8	73	20.1		-7	2.2	60	40.7		-12	15.0
40	128	15.5		14	35.5	115	29.9		9	43.1	102	59.2		4	15.0	90	35.9		-1	28.6	78	9.7		-7	6.7	65	30.0		-12	19.1
21 0	133	4.7	289.3	14	31.7	120	19.4	289.5	9	38.8	107	48.9	289.7	4	10.3	95	25.6	289.7	-1	33.4	82	59.2	289.6	-7	11.3	70	19.4	289.3	-12	23.1
20	137	54.0		14	28.0	125	8.9		9	34.4	112	38.5		4	5.6	100	15.3		-1	38.1	87	48.8		-7	15.8	75	8.7		-12	27.2
40	142	43.2		14	24.2	129	58.3		9	30.0	117	28.2		4	0.8	105	5.0		-1	42.9	92	38.4		-7	20.4	79	58.0		-12	31.2
22 0	147	32.5	289.3	14	20.5	134	47.8	289.5	9	25.6	122	17.8	289.7	3	56.1	109	54.7	289.7	-1	47.7	97	27.9	289.6	-7	24.9	84	47.3	289.3	-12	35.3
20	152	21.8		14	16.7	139	37.3		9	21.3	127	7.5		3	51.4	114	44.3		-1	52.5	102	17.5		-7	29.5	89	36.6		-12	39.3
40	157	11.0		14	12.9	144	26.8		9	16.9	131	57.1		3	46.7	119	34.0		-1	57.3	107	7.0		-7	34.0	94	25.9		-12	43.3
23 0	162	0.3	289.3	14	9.1	149	16.3	289.5	9	12.5	136	46.8	289.7	3	41.9	124	23.7	289.7	-2	2.0	111	56.6	289.5	-7	38.5	99	15.1	289.3	-12	47.3
20	166	49.6		14	5.3	154	5.8		9	8.1	141	36.5		3	37.2	129	13.4		-2	6.8	116	46.1		-7	43.1	104	4.4		-12	51.3
40	171	38.8		14	1.5	158	55.4		9	3.6	146	26.1		3	32.5	134	3.0		-2	11.6	121	35.7		-7	47.6	108	53.7		-12	55.3

2011 Moon

	5 Aug						6 Aug						7 Aug						8 Aug						9 Aug						10 Aug					
	GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec		
h m	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'
0 0	113	43.0	289.3	-12	59.3	-4.0	100	38.9	288.9	-17	19.3	-3.2	87	11.6	288.6	-20	35.9	-2.2	73	27.4	288.5	-22	37.0	-1.1	59	40.0	288.6	-23	16.1	0.0	46	6.8	288.9	-22	33.8	1.2
20	118	32.3		-13	3.3		105	27.8		-17	22.5		92	0.2		-20	38.1		78	15.9		-22	38.1		64	28.5		-23	16.1		50	55.7		-22	32.7	
40	123	21.5		-13	7.2		110	16.8		-17	25.7		96	48.9		-20	40.3		83	4.4		-22	39.2		69	17.1		-23	16.0		55	44.6		-22	31.5	
1 0	128	10.8	289.3	-13	11.2	-3.9	115	5.7	288.9	-17	28.9	-3.1	101	37.5	288.6	-20	42.5	-2.2	87	52.8	288.5	-22	40.3	-1.0	74	5.7	288.6	-23	16.0	0.1	60	33.4	288.9	-22	30.3	1.2
20	133	0.0		-13	15.2		119	54.6		-17	32.0		106	26.1		-20	44.7		92	41.3		-22	41.4		78	54.3		-23	15.9		65	22.4		-22	29.2	
40	137	49.3		-13	19.1		124	43.5		-17	35.2		111	14.8		-20	46.9		97	29.8		-22	42.4		83	42.8		-23	15.8		70	11.3		-22	28.0	
2 0	142	38.5	289.2	-13	23.0	-3.9	129	32.5	288.9	-17	38.3	-3.1	116	3.4	288.6	-20	49.0	-2.1	102	18.3	288.5	-22	43.4	-1.0	88	31.4	288.6	-23	15.7	0.2	75	0.2	288.9	-22	26.8	1.2
20	147	27.8		-13	26.9		134	21.4		-17	41.4		120	52.0		-20	51.2		107	6.8		-22	44.5		93	20.0		-23	15.5		79	49.1		-22	25.5	
40	152	17.0		-13	30.8		139	10.3		-17	44.5		125	40.6		-20	53.3		111	55.3		-22	45.5		98	8.6		-23	15.4		84	38.0		-22	24.3	
3 0	157	6.3	289.2	-13	34.7	-3.9	143	59.2	288.9	-17	47.6	-3.1	130	29.2	288.6	-20	55.4	-2.1	116	43.8	288.5	-22	46.4	-1.0	102	57.2	288.6	-23	15.2	0.2	89	27.0	288.9	-22	23.1	1.3
20	161	55.5		-13	38.6		148	48.1		-17	50.7		135	17.9		-20	57.5		121	32.3		-22	47.4		107	45.8		-23	15.0		94	15.9		-22	21.8	
40	166	44.7		-13	42.5		153	37.0		-17	53.8		140	6.5		-20	59.5		126	20.8		-22	48.4		112	34.4		-23	14.8		99	4.8		-22	20.5	
4 0	171	33.9	289.2	-13	46.4	-3.8	158	25.9	288.9	-17	56.9	-3.0	144	55.1	288.6	-21	1.6	-2.0	131	9.2	288.5	-22	49.3	-0.9	117	23.0	288.6	-23	14.6	0.2	103	53.8	289.0	-22	19.2	1.3
20	176	23.2		-13	50.3		163	14.8		-17	59.9		149	43.7		-21	3.6		135	57.7		-22	50.2		122	11.6		-23	14.4		108	42.8		-22	17.9	
40	181	12.4		-13	54.1		168	3.6		-18	2.9		154	32.3		-21	5.7		140	46.2		-22	51.1		127	0.2		-23	14.1		113	31.7		-22	16.6	
5 0	186	1.6	289.2	-13	57.9	-3.8	172	52.5	288.9	-18	6.0	-3.0	159	20.9	288.6	-21	7.7	-2.0	145	34.7	288.5	-22	52.0	-0.9	131	48.8	288.6	-23	13.9	0.3	118	20.7	289.0	-22	15.3	1.4
20	190	50.8		-14	1.8		177	41.4		-18	9.0		164	9.5		-21	9.7		150	23.2		-22	52.9		136	37.4		-23	13.6		123	9.7		-22	13.9	
40	195	40.0		-14	5.6		182	30.3		-18	12.0		168	58.1		-21	11.7		155	11.7		-22	53.7		141	26.0		-23	13.3		127	58.7		-22	12.6	
6 0	200	29.2	289.2	-14	9.4	-3.8	187	19.1	288.9	-18	15.0	-2.9	173	46.7	288.6	-21	13.6	-2.0	160	0.2	288.5	-22	54.6	-0.8	146	14.7	288.6	-23	13.0	0.3	132	47.6	289.0	-22	11.2	1.4
20	205	18.4		-14	13.2		192	8.0		-18	17.9		178	35.3		-21	15.6		164	48.7		-22	55.4		151	3.3		-23	12.7		137	36.6		-22	9.8	
40	210	7.6		-14	17.0		196	56.8		-18	20.9		183	23.8		-21	17.5		169	37.1		-22	56.2		155	51.9		-23	12.4		142	25.6		-22	8.4	
7 0	214	56.7	289.2	-14	20.8	-3.8	201	45.7	288.8	-18	23.8	-2.9	188	12.4	288.6	-21	19.5	-1.9	174	25.6	288.5	-22	57.0	-0.8	160	40.5	288.6	-23	12.0	0.4	147	14.7	289.0	-22	7.0	1.5
20	219	45.9		-14	24.6		206	34.5		-18	26.8		193	1.0		-21	21.4		179	14.1		-22	57.8		165	29.2		-23	11.6		152	3.7		-22	5.5	
40	224	35.1		-14	28.3		211	23.4		-18	29.7		197	49.6		-21	23.3		184	2.6		-22	58.5		170	17.8		-23	11.2		156	52.7		-22	4.1	
8 0	229	24.3	289.2	-14	32.1	-3.7	216	12.2	288.8	-18	32.6	-2.9	202	38.2	288.6	-21	25.1	-1.9	188	51.1	288.5	-22	59.3	-0.7	175	6.5	288.7	-23	10.8	0.4	161	41.7	289.0	-22	2.6	1.5
20	234	13.4		-14	35.8		221	1.1		-18	35.5		207	26.7		-21	27.0		193	39.6		-23	0.0		179	55.1		-23	10.4		166	30.8		-22	1.2	
40	239	2.6		-14	39.6		225	49.9		-18	38.4		212	15.3		-21	28.8		198	28.1		-23	0.7		184	43.8		-23	10.0		171	19.8		-21	59.7	
9 0	243	51.7	289.1	-14	43.3	-3.7	230	38.7	288.8	-18	41.2	-2.8	217	3.9	288.6	-21	30.7	-1.8	203	16.6	288.5	-23	1.4	-0.7	189	32.4	288.7	-23	9.6	0.5	176	8.9	289.1	-21	58.2	1.5
20	248	40.9		-14	47.0		235	27.5		-18	44.1		221	52.4		-21	32.5		208	5.1		-23	2.1		194	21.1		-23	9.1		180	57.9		-21	56.7	
40	253	30.0		-14	50.7		240	16.3		-18	46.9		226	41.0		-21	34.3		212	53.5		-23	2.8		199	9.7		-23	8.6		185	47.0		-21	55.1	
10 0	258	19.2	289.1	-14	54.4	-3.7	245	5.2	288.8	-18	49.7	-2.8	231	29.6	288.6	-21	36.1	-1.7	217	42.0	288.5	-23	3.4	-0.6	203	58.4	288.7	-23	8.1	0.5	190	36.1	289.1	-21	53.6	1.6
20	263	8.3		-14	58.1		249	54.0		-18	52.5		236	18.1		-21	37.8		222	30.5		-23	4.0		208	47.1		-23	7.6		195	25.1		-21	52.1	
40	267	57.4		-15	1.7		254	42.8		-18	55.3		241	6.7		-21	39.6		227	19.0		-23	4.7		213	35.8		-23	7.1		200	14.2		-21	50.5	
11 0	272	46.6	289.1	-15	5.4	-3.6	259	31.6	288.8	-18	58.1	-2.8	245	55.2	288.5	-21	41.3	-1.7	232	7.5	288.5	-23	5.3	-0.6	218	24.4	288.7	-23	6.5	0.6	205	3.3	289.1	-21	48.9	1.6
20	277	35.7		-15	9.0		264	20.4		-19	0.9		250	43.8		-21	43.1		236	56.0		-23	5.8		223	13.1		-23	6.0		209	52.4		-21	47.3	
40	282	24.8		-15	12.7		269	9.1		-19	3.7		255	32.3		-21	44.8		241	44.5		-23	6.4		228	1.8		-23	5.4		214	41.5		-21	45.7	
12 0	287	13.9	289.1	-15	16.3	-3.6	273	57.9	288.8	-19	6.4	-2.7	260	20.9	288.5	-21	46.5	-1.6	246	33.0	288.5	-23	7.0	-0.5	232	50.5	288.7	-23	4.8	0.6	219	30.6	289.1	-21	44.1	1.7
20	292	3.0		-15	19.9		278	46.7		-19	9.1		265	9.4		-21	48.1		251	21.5		-23	7.5		237	39.2		-23	4.2		224	19.7		-21	42.5	
40	296	52.1		-15	23.5		283	35.5		-19	11.9		269	58.0		-21	49.8		256	10.0		-23	8.0		242	27.9		-23	3.6		229	8.9		-21	40.8	
13 0	301	41.2	289.1	-15	27.1	-3.6	288	24.3	288.8	-19	14.6	-2.7	274	46.5	288.5	-21	51.4	-1.6	260	58.5	288.5	-23	8.5	-0.5	247	16.6	288.7	-23	3.0	0.7	233	58.0	289.1	-21	39.1	1.7
20	306	30.3		-15	30.7		293	13.0		-19	17.3		279	35.0		-21	53.1		265	47.0		-23	9.0		252	5.3		-23	2.3		238	47.1		-21	37.5	
40	311	19.4		-15	34.3		298	1.8		-19	19.9		284	23.6		-21	54.7		270	35.5		-23	9.5		256	54.0		-23	1.7		243	36.3		-21	35.8	
14 0	316	8.5	289.1	-15	37.8	-3.5	302	50.6	288.8	-19	22.6	-2.6	289	12.1	288.5	-21	56.3	-1.6	275	24.0	288.5	-23	9.9	-0.4	261	42.8	288.7	-23	1.0	0.7	248	25.4	289.2	-21	34.1	1.7
20	320	57.6		-15	41.4		307	39.3		-19	25.2		294	0.6		-21	57.9		280	12.5		-23	10.4		266	31.5		-23	0.3		253	14.6		-21	32.4	
40	325	46.7		-15	44.9		312	28.1		-19	27.9		298	49.2		-21	59.5		285	1.0		-23	10.8		271	20.2		-22	59.6		258	3.8		-21	30.6	
15 0	330	35.7	289.1	-15	48.4	-3.5	317	16.8	288.7	-19	30.5	-2.6	303	37.7	288.5	-22	1.0	-1.5	289	49.5	288.5	-23	11.2	-0.4	276	9.0	288.7	-22	58.9	0.8	262	52.9	289.2	-21	28.9	1.8
20	335	24.8		-15	51.9		322	5.6		-19	33.1		308	26.2		-22	2.5		294	38.0		-23	11.6		280	57.7		-22	58.2		267	42.1		-21	27.2	
40	340	13.9		-15	55.5		326	54.3		-19	35.7		313	14.7		-22	4.1		299	26.6		-23	12.0		285	46.4		-22	57.4		272	31.3		-21	25.4	
16 0	345	2.9	289.0	-15	58.9	-3.5	331	43.0	288.7	-19	38.3	-2.5	318	3.3	288.5	-22	5.6	-1.5	304	15.1	288.5	-23	12.3	-0.3	290	35.2	288.8	-22	56.6	0.8	277	20.5	289.2	-21	23.6	1.8
20	349	52.0		-16	2.4		336	31.8		-19	40.8		322	51.8		-22	7.1		309	3.6		-23	12.7		295	24.0		-22	55.9		282	9.7		-21	21.8	
40	354	41.0		-16	5.9		341	20.5		-19	43.4		327	40.3		-22	8.5		313	52.1		-23	13.0		300	12.7		-22	55.1		286	58.9		-21	20.0	
17 0	359	30.1	289.0	-16	9.4	-3.4	346	9.2	288.7	-19	45.9	-2.5	332	28.8	288.5	-22	10.0	-1.4	318	40.6	288.5	-23	13.3	-0.3	305	1.5	288.8	-22	54.2	0.8	291	48.2	289.2	-21	18.2	1.8
20	4	19.1		-16	12.8		350	57.9		-19	48.5		337	17.3		-22	11.4		323	29.1		-23	13.6		309	50.2		-22	53.4		296	37.4		-21	16.4	
40	9	8.1		-16	16.2		355	46.7		-19	51.0		342	5.8		-22	12.9		328	17.7		-23	13.9		314	39.0		-22	52.6		301	26.6		-21	14.5	
18 0	13	57.2	289.0	-16	19.7	-3.4	0	35.4	288.7	-19	53.5	-2.5	346	54.4	288.5	-22	14.3	-1.4	333	6.2	288.5	-23	14.1	-0.2	319	27.8	288.8	-22	51.7	0.9	306	15.9	289.3	-21	12.7	1.9
20	18	46.2		-16	23.1		5	24.1		-19	55.9		351	42.9		-22	15.7		337	54.7		-23	14.4		324	16.6		-22	50.9		311	5.1		-21	10.8	
40	23	35.2		-16	26.5		10	12.8		-19	58.4		356	31.4		-22	17.1		342	43.2		-23	14.6		329	5.4		-22	50.0		315	54.4		-21	8.9	
19 0	28	24.2	289.0	-16	29.9	-3.4	15	1.5	288.7	-20	0.9	-2.4	1	19.9	288.5	-22	18.4	-1.3	347	31.8	288.5	-23	14.8	-0.2	333	54.2	288.8	-22	49.1	0.9	320	43.6	289.3	-21	7.0	1.9
20	33	13.2		-16	33.3		19	50.2		-20	3.3		6	8.4		-22	19.8		352	20.3		-23	15.0		338	43.0		-22	48.2		325	32.9		-21	5.1	
40	38	2.2		-16	36.6		24	38.9		-20	5.7		10	56.9		-22	21.1		357	8.8		-23	15.2		343	31.8		-22	47.2		330	22.2		-21	3.2	
20 0	42	51.2	289.0	-16	40.0	-3.3	29	27.6	288.7	-20	8.1	-2.4	15	45.4	288.5	-22	22.4	-1.3	1	57.4	288.5	-23	15.4	-0.1	348	20.6	288.8	-22	46.3	1.0	335	11.5	289.3	-21	1.3	2.0
20	47	40.2		-16	43.3		34	16.3		-20	10.5		20	33.9		-22	23.7		6	45.9		-23	15.5		353	9.4		-22	45.3		340	0.8		-20	59.3	
40	52	29.2		-16	46.6		39	4.9		-20	12.9		25	22.4		-22	25.0		11	34.4		-23	15.7		357	58.2		-22	44.3		344	50.1		-20	57.4	
21 0	57	18.2	289.0	-16	50.0	-3.3	43	53.6	288.7	-20	15.3	-2.3	30	10.9	288.5	-22	26.3	-1.2	16	23.0	288.5	-23	15.8	-0.1	2	47.1	288.8	-22	43.4	1.0	349	39.4	289.3	-20	55.4	2.0
20	62	7.2		-16	53.3		48	42.3		-20	17.6		34	59.4		-22	27.5		21	11.5		-23	15.9		7	35.9		-22	42.3		354	28.7		-20	53.4	
40	66	56.2		-16	56.6		53	31.0		-20	20.0		39	47.9		-22	28.8		26	0.1		-23	16.0		12	24.7		-22	41.3		359	18.0		-20	51.4	
22 0	71	45.1	289.0	-16	59.9	-3.2	58	19.6	288.7	-20	22.3	-2.3	44	36.4	288.5	-22	30.0	-1.2	30	48.6	288.6	-23	16.0	-0.1	17	13.6	288.9	-22	40.3	1.1	4	7.4	289.3	-20	49.4	2.0
20	76	34.1		-17	3.1		63	8.3		-20	24.6		49	24.9		-22	31.2		35	37.2		-23	16.1		22	2.4		-22	39.2		8	56.7		-20	47.4	
40	81	23.1		-17	6.4		67	57.0		-20	26.9		54	13.4		-22	32.4		40	25.7		-23	16.1		26	51.3		-22	38.2		13	46.0		-20	45.4	
23 0	86	12.0	289.0	-17	9.6	-3.2	72	45.6	288.7	-20	29.2	-2.2	59	1.9	288.5	-22	33.6	-1.1	45	14.3	288.6	-23	16.2	0.0	31	40.2	288.9	-22	37.1	1.1	18	35.4	289.4	-20	43.3	2.1
20	91	1.0		-17	12.9		77	34.3		-20	31.4		63	50.4		-22	34.7		50	2.8		-23	16.2		36	29.0		-22	36.0		23	24.8		-20	41.3	
40	95	49.9		-17	16.1		82	22.9		-20	33.7		68	38.9		-22	35.9		54	51.4		-23	16.2		41	17.9		-22	34.9		28	14.1		-20	39.2	

2011 Moon

	11 Aug							12 Aug							13 Aug							14 Aug							15 Aug							16 Aug						
	GHA			Dec				GHA			Dec				GHA			Dec				GHA			Dec				GHA			Dec				GHA			Dec			
h m	o	'	d	o	'	d	'	o	'	d	o	'	d	'	o	'	d	o	'	d	'	o	'	d	o	'	d	'	o	'	d	o	'	d	'	o	'	d	o	'	d	'
0 0	33	3.5	289.4	-20	37.1	2.1		20	39.9	290.0	-17	38.3	2.9		8	58.2	290.5	-13	51.6	3.4		357	54.5	291.0	-9	32.1	3.8		347	20.8	291.4	-4	53.3	3.9		337	7.0	291.6	-0	7.5	4.0
20	37	52.9		-20	35.1			25	29.9		-17	35.4			13	48.7		-13	48.2			2	45.5		-9	28.3			352	12.2		-4	49.4			341	58.5		-0	3.5	
40	42	42.3		-20	32.9			30	19.8		-17	32.5			18	39.3		-13	44.8			7	36.5		-9	24.5			357	3.5		-4	45.4			346	50.1		0	0.5	
1 0	47	31.7	289.4	-20	30.8	2.1		35	9.8	290.0	-17	29.7	2.9		23	29.8	290.6	-13	41.4	3.4		12	27.6	291.0	-9	20.8	3.8		1	54.9	291.4	-4	41.5	4.0		351	41.7	291.6	0	4.4	4.0
20	52	21.1		-20	28.7			39	59.8		-17	26.8			28	20.4		-13	37.9			17	18.6		-9	17.0			6	46.3		-4	37.5			356	33.2		0	8.4	
40	57	10.5		-20	26.6			44	49.8		-17	23.9			33	11.0		-13	34.5			22	9.6		-9	13.2			11	37.6		-4	33.6			1	24.8		0	12.4	
2 0	61	59.9	289.4	-20	24.4	2.2		49	39.8	290.0	-17	21.0	2.9		38	1.5	290.6	-13	31.1	3.5		27	0.7	291.1	-9	9.4	3.8		16	29.0	291.4	-4	29.6	4.0		6	16.4	291.6	0	16.3	4.0
20	66	49.4		-20	22.3			54	29.8		-17	18.1			42	52.1		-13	27.6			31	51.7		-9	5.6			21	20.4		-4	25.6			11	7.9		0	20.3	
40	71	38.8		-20	20.1			59	19.9		-17	15.2			47	42.7		-13	24.2			36	42.8		-9	1.8			26	11.8		-4	21.7			15	59.5		0	24.2	
3 0	76	28.3	289.5	-20	17.9	2.2		64	9.9	290.1	-17	12.2	2.9		52	33.3	290.6	-13	20.7	3.5		41	33.8	291.1	-8	58.0	3.8		31	3.2	291.4	-4	17.7	3.9		20	51.1	291.6	0	28.2	4.0
20	81	17.7		-20	15.7			68	60.0		-17	9.3			57	23.9		-13	17.2			46	24.9		-8	54.2			35	54.6		-4	13.8			25	42.7		0	32.2	
40	86	7.2		-20	13.5			73	50.0		-17	6.3			62	14.5		-13	13.8			51	16.0		-8	50.4			40	46.0		-4	9.8			30	34.2		0	36.1	
4 0	90	56.7	289.5	-20	11.3	2.3		78	40.1	290.1	-17	3.4	3.0		67	5.1	290.6	-13	10.3	3.5		56	7.1	291.1	-8	46.6	3.8		45	37.4	291.4	-4	5.9	4.0		35	25.8	291.6	0	40.1	4.0
20	95	46.1		-20	9.0			83	30.1		-17	0.4			71	55.7		-13	6.8			60	58.1		-8	42.8			50	28.8		-4	1.9			40	17.4		0	44.0	
40	100	35.6		-20	6.8			88	20.2		-16	57.5			76	46.4		-13	3.3			65	49.2		-8	39.0			55	20.2		-3	57.9			45	9.0		0	48.0	
5 0	105	25.1	289.5	-20	4.5	2.3		93	10.3	290.1	-16	54.5	3.0		81	37.0	290.7	-12	59.8	3.5		70	40.3	291.1	-8	35.2	3.8		60	11.6	291.4	-3	54.0	4.0		50	0.6	291.6	0	52.0	3.9
20	110	14.6		-20	2.3			98	0.4		-16	51.5			86	27.7		-12	56.3			75	31.4		-8	31.3			65	3.0		-3	50.0			54	52.2		0	55.9	
40	115	4.2		-20	0.0			102	50.5		-16	48.5			91	18.3		-12	52.8			80	22.5		-8	27.5			69	54.5		-3	46.0			59	43.7		0	59.9	
6 0	119	53.7	289.5	-19	57.7	2.3		107	40.6	290.1	-16	45.5	3.0		96	9.0	290.7	-12	49.3	3.5		85	13.6	291.1	-8	23.7	3.8		74	45.9	291.4	-3	42.1	4.0		64	35.3	291.6	1	3.8	4.0
20	124	43.2		-19	55.4			112	30.7		-16	42.5			100	59.6		-12	45.8			90	4.7		-8	19.9			79	37.3		-3	38.1			69	26.9		1	7.8	
40	129	32.7		-19	53.1			117	20.8		-16	39.5			105	50.3		-12	42.2			94	55.9		-8	16.0			84	28.7		-3	34.1			74	18.5		1	11.7	
7 0	134	22.3	289.6	-19	50.8	2.4		122	11.0	290.1	-16	36.4	3.0		110	41.0	290.7	-12	38.7	3.5		99	47.0	291.1	-8	12.2	3.8		89	20.2	291.4	-3	30.2	4.0		79	10.1	291.6	1	15.7	3.9
20	139	11.8		-19	48.4			127	1.1		-16	33.4			115	31.7		-12	35.2			104	38.1		-8	8.3			94	11.6		-3	26.2			84	1.7		1	19.6	
40	144	1.4		-19	46.1			131	51.3		-16	30.3			120	22.4		-12	31.6			109	29.3		-8	4.5			99	3.1		-3	22.2			88	53.3		1	23.6	
8 0	148	51.0	289.6	-19	43.7	2.4		136	41.4	290.2	-16	27.3	3.1		125	13.1	290.7	-12	28.1	3.6		114	20.4	291.2	-8	0.7	3.9		103	54.5	291.4	-3	18.3	4.0		93	44.9	291.6	1	27.5	3.9
20	153	40.5		-19	41.4			141	31.6		-16	24.2			130	3.8		-12	24.5			119	11.5		-7	56.8			108	46.0		-3	14.3			98	36.5		1	31.4	
40	158	30.1		-19	39.0			146	21.8		-16	21.1			134	54.5		-12	21.0			124	2.7		-7	53.0			113	37.4		-3	10.3			103	28.1		1	35.4	
9 0	163	19.7	289.6	-19	36.6	2.4		151	11.9	290.2	-16	18.1	3.1		139	45.2	290.7	-12	17.4	3.6		128	53.9	291.2	-7	49.1	3.9		118	28.9	291.5	-3	6.3	4.0		108	19.7	291.6	1	39.3	3.9
20	168	9.3		-19	34.2			156	2.1		-16	15.0			144	35.9		-12	13.8			133	45.0		-7	45.2			123	20.3		-3	2.4			113	11.3		1	43.3	
40	172	58.9		-19	31.8			160	52.3		-16	11.9			149	26.7		-12	10.2			138	36.2		-7	41.4			128	11.8		-2	58.4			118	2.9		1	47.2	
10 0	177	48.6	289.6	-19	29.4	2.5		165	42.5	290.2	-16	8.8	3.1		154	17.4	290.8	-12	6.7	3.6		143	27.4	291.2	-7	37.5	3.9		133	3.2	291.5	-2	54.4	4.0		122	54.5	291.6	1	51.1	3.9
20	182	38.2		-19	26.9			170	32.7		-16	5.7			159	8.2		-12	3.1			148	18.5		-7	33.7			137	54.7		-2	50.4			127	46.1		1	55.1	
40	187	27.8		-19	24.5			175	23.0		-16	2.5			163	58.9		-11	59.5			153	9.7		-7	29.8			142	46.2		-2	46.5			132	37.7		1	59.0	
11 0	192	17.5	289.7	-19	22.0	2.5		180	13.2	290.2	-15	59.4	3.1		168	49.7	290.8	-11	55.9	3.6		158	0.9	291.2	-7	25.9	3.9		147	37.6	291.5	-2	42.5	4.0		137	29.3	291.6	2	2.9	3.9
20	197	7.1		-19	19.6			185	3.4		-15	56.3			173	40.5		-11	52.3			162	52.1		-7	22.0			152	29.1		-2	38.5			142	20.9		2	6.9	
40	201	56.8		-19	17.1			189	53.7		-15	53.1			178	31.2		-11	48.7			167	43.3		-7	18.2			157	20.6		-2	34.5			147	12.5		2	10.8	
12 0	206	46.4	289.7	-19	14.6	2.5		194	43.9	290.3	-15	50.0	3.2		183	22.0	290.8	-11	45.1	3.6		172	34.5	291.2	-7	14.3	3.9		162	12.1	291.5	-2	30.6	4.0		152	4.1	291.6	2	14.7	3.9
20	211	36.1		-19	12.1			199	34.2		-15	46.8			188	12.8		-11	41.5			177	25.7		-7	10.4			167	3.5		-2	26.6			156	55.7		2	18.6	
40	216	25.8		-19	9.6			204	24.5		-15	43.6			193	3.6		-11	37.8			182	16.9		-7	6.5			171	55.0		-2	22.6			161	47.3		2	22.6	
13 0	221	15.5	289.7	-19	7.1	2.6		209	14.7	290.3	-15	40.5	3.2		197	54.4	290.8	-11	34.2	3.6		187	8.1	291.2	-7	2.6	3.9		176	46.5	291.5	-2	18.6	4.0		166	38.9	291.6	2	26.5	3.9
20	226	5.2		-19	4.5			214	5.0		-15	37.3			202	45.2		-11	30.6			191	59.4		-6	58.8			181	38.0		-2	14.7			171	30.5		2	30.4	
40	230	54.9		-19	2.0			218	55.3		-15	34.1			207	36.0		-11	27.0			196	50.6		-6	54.9			186	29.5		-2	10.7			176	22.1		2	34.3	
14 0	235	44.6	289.7	-18	59.4	2.6		223	45.6	290.3	-15	30.9	3.2		212	26.9	290.8	-11	23.3	3.6		201	41.8	291.2	-6	51.0	3.9		191	21.0	291.5	-2	6.7	4.0		181	13.7	291.6	2	38.2	3.9
20	240	34.3		-18	56.9			228	35.9		-15	27.7			217	17.7		-11	19.7			206	33.0		-6	47.1			196	12.5		-2	2.7			186	5.3		2	42.2	
40	245	24.1		-18	54.3			233	26.2		-15	24.5			222	8.5		-11	16.0			211	24.3		-6	43.2			201	4.0		-1	58.8			190	57.0		2	46.1	
15 0	250	13.8	289.8	-18	51.7	2.6		238	16.6	290.3	-15	21.3	3.2		226	59.4	290.9	-11	12.4	3.7		216	15.5	291.3	-6	39.3	3.9		205	55.5	291.5	-1	54.8	4.0		195	48.6	291.6	2	50.0	3.9
20	255	3.5		-18	49.1			243	6.9		-15	18.0			231	50.2		-11	8.7			221	6.8		-6	35.4			210	47.0		-1	50.8			200	40.2		2	53.9	
40	259	53.3		-18	46.5			247	57.2		-15	14.8			236	41.1		-11	5.0			225	58.0		-6	31.5			215	38.5		-1	46.8			205	31.8		2	57.8	
16 0	264	43.1	289.8	-18	43.9	2.6		252	47.6	290.4	-15	11.6	3.3		241	31.9	290.9	-11	1.4	3.7		230	49.3	291.3	-6	27.6	3.9		220	30.0	291.5	-1	42.9	4.0		210	23.4	291.6	3	1.7	3.9
20	269	32.8		-18	41.3			257	37.9		-15	8.3			246	22.8		-10	57.7			235	40.6		-6	23.7			225	21.5		-1	38.9			215	15.0		3	5.6	
40	274	22.6		-18	38.7			262	28.3		-15	5.0			251	13.7		-10	54.0			240	31.8		-6	19.8			230	13.1		-1	34.9			220	6.6		3	9.5	
17 0	279	12.4	289.8	-18	36.0	2.7		267	18.7	290.4	-15	1.8	3.3		256	4.6	290.9	-10	50.3	3.7		245	23.1	291.3	-6	15.9	3.9		235	4.6	291.5	-1	30.9	4.0		224	58.2	291.6	3	13.4	3.9
20	284	2.2		-18	33.4			272	9.0		-14	58.5			260	55.5		-10	46.7			250	14.4		-6	11.9			239	56.1		-1	26.9			229	49.8		3	17.3	
40	288	52.0		-18	30.7			276	59.4		-14	55.2			265	46.3		-10	43.0			255	5.7		-6	8.0			244	47.6		-1	23.0			234	41.5		3	21.2	
18 0	293	41.8	289.8	-18	28.0	2.7		281	49.8	290.4	-14	51.9	3.3		270	37.2	290.9	-10	39.3	3.7		259	56.9	291.3	-6	4.1	3.9		249	39.1	291.5	-1	19.0	4.0		239	33.1	291.6	3	25.1	3.9
20	298	31.6		-18	25.4			286	40.2		-14	48.7			275	28.2		-10	35.6			264	48.2		-6	0.2			254	30.7		-1	15.0			244	24.7		3	29.0	
40	303	21.5		-18	22.7			291	30.6		-14	45.4			280	19.1		-10	31.9			269	39.5		-5	56.3			259	22.2		-1	11.0			249	16.3		3	32.9	
19 0	308	11.3	289.9	-18	20.0	2.7		296	21.0	290.4	-14	42.0	3.3		285	10.0	290.9	-10	28.2	3.7		274	30.8	291.3	-5	52.3	3.9		264	13.7	291.5	-1	7.1	4.0		254	7.9	291.6	3	36.7	3.9
20	313	1.2		-18	17.2			301	11.5		-14	38.7			290	0.9		-10	24.5			279	22.1		-5	48.4			269	5.3		-1	3.1			258	59.5		3	40.6	
40	317	51.0		-18	14.5			306	1.9		-14	35.4			294	51.8		-10	20.7			284	13.4		-5	44.5			273	56.8		-0	59.1			263	51.1		3	44.5	
20 0	322	40.9	289.9	-18	11.8	2.8		310	52.3	290.5	-14	32.1	3.3		299	42.8	290.9	-10	17.0	3.7		289	4.7	291.3	-5	40.6	3.9		278	48.3	291.5	-0	55.1	4.0		268	42.7	291.6	3	48.4	3.9
20	327	30.8		-18	9.0			315	42.8		-14	28.8			304	33.7		-10	13.3			293	56.1		-5	36.6			283	39.9		-0	51.2			273	34.4		3	52.3	
40	332	20.6		-18	6.3			320	33.2		-14	25.4			309	24.7		-10	9.6			298	47.4		-5	32.7			288	31.4		-0	47.2			278	26.0		3	56.2	
21 0	337	10.5	289.9	-18	3.5	2.8		325	23.7	290.5	-14	22.1	3.4		314	15.6	291.0	-10	5.8	3.7		303	38.7	291.3	-5	28.8	3.9		293	23.0	291.5	-0	43.2	4.0		283	17.6	291.6	4	0.0	3.9
20	342	0.4		-18	0.8			330	14.2		-14	18.7			319	6.6		-10	2.1			308	30.0		-5	24.8			298	14.5		-0	39.2			288	9.2		4	3.9	
40	346	50.3		-17	58.0			335	4.6		-14	15.3			323	57.6		-9	58.4			313	21.4		-5	20.9			303	6.1		-0	35.3			293	0.8		4	7.8	
22 0	351	40.2	289.9	-17	55.2	2.8		339	55.1	290.5	-14	12.0	3.4		328	48.5	291.0	-9	54.6	3.7		318	12.7	291.3	-5	17.0	4.0		307	57.6	291.6	-0	31.3	4.0		297	52.4	291.6	4	11.6	3.9
20	356	30.2		-17	52.4			344	45.6		-14	8.6			333	39.5		-9	50.9			323	4.0		-5	13.0			312	49.2		-0	27.3			302	44.0		4	15.5	
40	1	20.1		-17	49.6			349	36.1		-14	5.2			338	30.5		-9	47.1			327	55.4		-5	9.1			317	40.7		-0	23.4			307	35.6		4	19.4	
23 0	6	10.0	290.0	-17	46.8	2.8		354	26.6	290.5	-14	1.8	3.4		343	21.5	291.0	-9	43.4	3.8		332	46.7	291.4	-5	5.1	3.9		322	32.3	291.6	-0	19.4	4.0		312	27.3	291.6	4	23.2	3.9
20	10	60.0		-17	43.9			359	17.1		-13	58.4			348	12.5		-9	39.6			337	38.1		-5	1.2			327	23.8		-0	15.4			317	18.9		4	27.1	
40	15	49.9		-17	41.1			4	7.7		-13	55.0			353	3.5		-9	35.8			342	29.4		-4	57.2			332	15.4		-0	11.4			322	10.5		4	30.9	

2011 Moon

	17 Aug						18 Aug						19 Aug						20 Aug						21 Aug						22 Aug					
	GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec		
h m	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'
0 0	327	2.1	291.6	4	34.8		316	55.2	291.5	9	4.0		306	36.0	291.3	13	11.2		295	55.0	290.9	16	47.7		284	45.1	290.5	19	44.4		273	1.9	290.0	21	51.6	
20	331	53.7		4	38.6	3.8	321	46.7		9	7.6	3.6	311	27.2		13	14.4	3.2	300	45.9		16	50.5	2.7	289	35.5		19	46.5	2.1	277	51.9		21	52.9	1.3
40	336	45.3		4	42.5		326	38.2		9	11.2		316	18.5		13	17.7		305	36.8		16	53.2		294	26.0		19	48.6		282	41.9		21	54.3	
1 0	341	36.9	291.6	4	46.3		331	29.7	291.5	9	14.8		321	9.8	291.2	13	20.9		310	27.7	290.9	16	55.9		299	16.4	290.4	19	50.7		287	31.9	290.0	21	55.6	
20	346	28.5		4	50.2	3.8	336	21.2		9	18.4	3.6	326	1.0		13	24.1	3.2	315	18.6		16	58.7	2.7	304	6.9		19	52.8	2.1	292	21.9		21	57.0	1.3
40	351	20.1		4	54.0		341	12.7		9	21.9		330	52.3		13	27.3		320	9.5		17	1.4		308	57.3		19	54.9		297	11.9		21	58.3	
2 0	356	11.7	291.6	4	57.8		346	4.2	291.5	9	25.5		335	43.5	291.2	13	30.5		325	0.4	290.9	17	4.1		313	47.8	290.4	19	57.0		302	1.8	290.0	21	59.6	
20	1	3.3		5	1.7	3.8	350	55.7		9	29.1	3.6	340	34.7		13	33.7	3.2	329	51.3		17	6.8	2.7	318	38.2		19	59.0	2.1	306	51.8		22	0.9	1.3
40	5	55.0		5	5.5		355	47.2		9	32.7		345	26.0		13	36.9		334	42.1		17	9.5		323	28.6		20	1.1		311	41.7		22	2.2	
3 0	10	46.6	291.6	5	9.3		0	38.7	291.5	9	36.2		350	17.2	291.2	13	40.1		339	33.0	290.9	17	12.2		328	19.0	290.4	20	3.2		316	31.7	289.9	22	3.5	
20	15	38.2		5	13.2	3.8	5	30.2		9	39.8	3.6	355	8.4		13	43.3	3.2	344	23.8		17	14.8	2.7	333	9.4		20	5.2	2.0	321	21.6		22	4.8	1.3
40	20	29.8		5	17.0		10	21.7		9	43.4		359	59.7		13	46.5		349	14.7		17	17.5		337	59.8		20	7.2		326	11.5		22	6.0	
4 0	25	21.4	291.6	5	20.8		15	13.1	291.5	9	46.9		4	50.9	291.2	13	49.7		354	5.5	290.8	17	20.2		342	50.2	290.4	20	9.2		331	1.5	289.9	22	7.3	
20	30	13.0		5	24.6	3.8	20	4.6		9	50.5	3.6	9	42.1		13	52.8	3.1	358	56.4		17	22.8	2.6	347	40.6		20	11.3	2.0	335	51.4		22	8.5	1.2
40	35	4.6		5	28.4		24	56.1		9	54.0		14	33.3		13	56.0		3	47.2		17	25.5		352	31.0		20	13.3		340	41.3		22	9.7	
5 0	39	56.2	291.6	5	32.2		29	47.6	291.5	9	57.6		19	24.5	291.2	13	59.1		8	38.0	290.8	17	28.1		357	21.4	290.4	20	15.3		345	31.2	289.9	22	10.9	
20	44	47.8		5	36.0	3.8	34	39.0		10	1.1	3.5	24	15.7		14	2.3	3.2	13	28.8		17	30.7	2.6	2	11.7		20	17.2	2.0	350	21.1		22	12.1	1.2
40	49	39.4		5	39.8		39	30.5		10	4.6		29	6.9		14	5.4		18	19.7		17	33.4		7	2.1		20	19.2		355	11.0		22	13.3	
6 0	54	31.0	291.6	5	43.7		44	22.0	291.5	10	8.2		33	58.1	291.2	14	8.6		23	10.5	290.8	17	36.0		11	52.5	290.3	20	21.2		0	0.9	289.9	22	14.5	
20	59	22.6		5	47.4	3.8	49	13.4		10	11.7	3.5	38	49.3		14	11.7	3.1	28	1.3		17	38.6	2.6	16	42.8		20	23.1	1.9	4	50.8		22	15.7	1.2
40	64	14.2		5	51.2		54	4.9		10	15.2		43	40.5		14	14.8		32	52.1		17	41.2		21	33.1		20	25.1		9	40.7		22	16.8	
7 0	69	5.8	291.6	5	55.0		58	56.3	291.4	10	18.7		48	31.6	291.2	14	17.9		37	42.9	290.8	17	43.8		26	23.5	290.3	20	27.0		14	30.5	289.9	22	18.0	
20	73	57.4		5	58.8	3.8	63	47.8		10	22.2	3.5	53	22.8		14	21.0	3.1	42	33.7		17	46.4	2.6	31	13.8		20	28.9	1.9	19	20.4		22	19.1	1.1
40	78	49.0		6	2.6		68	39.2		10	25.7		58	14.0		14	24.1		47	24.4		17	48.9		36	4.1		20	30.8		24	10.2		22	20.2	
8 0	83	40.5	291.6	6	6.4		73	30.7	291.4	10	29.2		63	5.1	291.2	14	27.2		52	15.2	290.8	17	51.5		40	54.5	290.3	20	32.7		29	0.1	289.8	22	21.3	
20	88	32.1		6	10.2	3.8	78	22.1		10	32.7	3.5	67	56.3		14	30.3	3.1	57	6.0		17	54.0	2.5	45	44.8		20	34.6	1.9	33	49.9		22	22.4	1.1
40	93	23.7		6	14.0		83	13.6		10	36.2		72	47.5		14	33.4		61	56.7		17	56.6		50	35.1		20	36.5		38	39.8		22	23.5	
9 0	98	15.3	291.6	6	17.7		88	5.0	291.4	10	39.7		77	38.6	291.1	14	36.5		66	47.5	290.7	17	59.1		55	25.4	290.3	20	38.4		43	29.6	289.8	22	24.5	
20	103	6.9		6	21.5	3.8	92	56.4		10	43.2	3.5	82	29.7		14	39.5	3.1	71	38.2		18	1.7	2.5	60	15.7		20	40.2	1.8	48	19.4		22	25.6	1.1
40	107	58.5		6	25.3		97	47.9		10	46.7		87	20.9		14	42.6		76	29.0		18	4.2		65	5.9		20	42.1		53	9.3		22	26.6	
10 0	112	50.1	291.6	6	29.0		102	39.3	291.4	10	50.1		92	12.0	291.1	14	45.7		81	19.7	290.7	18	6.7		69	56.2	290.3	20	43.9		57	59.1	289.8	22	27.7	
20	117	41.7		6	32.8	3.8	107	30.7		10	53.6	3.5	97	3.1		14	48.7	3.0	86	10.5		18	9.2	2.5	74	46.5		20	45.7	1.8	62	48.9		22	28.7	1.0
40	122	33.3		6	36.6		112	22.1		10	57.1		101	54.3		14	51.8		91	1.2		18	11.7		79	36.8		20	47.6		67	38.7		22	29.7	
11 0	127	24.8	291.6	6	40.3		117	13.5	291.4	11	0.5		106	45.4	291.1	14	54.8		95	51.9	290.7	18	14.2		84	27.0	290.2	20	49.4		72	28.5	289.8	22	30.7	
20	132	16.4		6	44.1	3.8	122	4.9		11	4.0	3.5	111	36.5		14	57.8	3.0	100	42.6		18	16.7	2.5	89	17.3		20	51.2	1.8	77	18.3		22	31.7	1.0
40	137	8.0		6	47.8		126	56.4		11	7.4		116	27.6		15	0.8		105	33.3		18	19.1		94	7.5		20	53.0		82	8.1		22	32.7	
12 0	141	59.6	291.6	6	51.6		131	47.8	291.4	11	10.9		121	18.7	291.1	15	3.9		110	24.0	290.7	18	21.6		98	57.7	290.2	20	54.7		86	57.8	289.8	22	33.6	
20	146	51.1		6	55.3	3.7	136	39.2		11	14.3	3.4	126	9.8		15	6.9	3.0	115	14.7		18	24.1	2.4	103	48.0		20	56.5	1.8	91	47.6		22	34.6	0.9
40	151	42.7		6	59.0		141	30.6		11	17.7		131	0.9		15	9.9		120	5.4		18	26.5		108	38.2		20	58.3		96	37.4		22	35.5	
13 0	156	34.3	291.6	7	2.8		146	22.0	291.4	11	21.2		135	52.0	291.1	15	12.9		124	56.1	290.7	18	28.9		113	28.4	290.2	21	0.0		101	27.1	289.7	22	36.4	
20	161	25.9		7	6.5	3.7	151	13.4		11	24.6	3.4	140	43.1		15	15.9	3.0	129	46.8		18	31.4	2.4	118	18.6		21	1.7	1.7	106	16.9		22	37.3	0.9
40	166	17.4		7	10.2		156	4.7		11	28.0		145	34.2		15	18.8		134	37.4		18	33.8		123	8.8		21	3.5		111	6.6		22	38.2	
14 0	171	9.0	291.6	7	14.0		160	56.1	291.4	11	31.4		150	25.2	291.1	15	21.8		139	28.1	290.7	18	36.2		127	59.0	290.2	21	5.2		115	56.4	289.7	22	39.1	
20	176	0.6		7	17.7	3.7	165	47.5		11	34.8	3.4	155	16.3		15	24.8	3.0	144	18.7		18	38.6	2.4	132	49.2		21	6.9	1.7	120	46.1		22	40.0	0.9
40	180	52.1		7	21.4		170	38.9		11	38.2		160	7.4		15	27.7		149	9.4		18	41.0		137	39.4		21	8.6		125	35.8		22	40.8	
15 0	185	43.7	291.6	7	25.1		175	30.3	291.4	11	41.6		164	58.4	291.0	15	30.7		154	0.0	290.6	18	43.4		142	29.6	290.2	21	10.3		130	25.6	289.7	22	41.7	
20	190	35.3		7	28.8	3.7	180	21.6		11	45.0	3.4	169	49.5		15	33.6	2.9	158	50.7		18	45.8	2.4	147	19.8		21	11.9	1.6	135	15.3		22	42.5	0.8
40	195	26.8		7	32.5		185	13.0		11	48.4		174	40.5		15	36.6		163	41.3		18	48.1		152	9.9		21	13.6		140	5.0		22	43.3	
16 0	200	18.4	291.6	7	36.2		190	4.4	291.4	11	51.8		179	31.6	291.0	15	39.5		168	31.9	290.6	18	50.5		157	0.1	290.1	21	15.2		144	54.7	289.7	22	44.1	
20	205	9.9		7	39.9	3.7	194	55.7		11	55.1	3.4	184	22.6		15	42.4	2.9	173	22.6		18	52.8	2.3	161	50.2		21	16.9	1.6	149	44.4		22	44.9	0.8
40	210	1.5		7	43.6		199	47.1		11	58.5		189	13.7		15	45.4		178	13.2		18	55.2		166	40.4		21	18.5		154	34.1		22	45.7	
17 0	214	53.1	291.5	7	47.3		204	38.4	291.3	12	1.9		194	4.7	291.0	15	48.3		183	3.8	290.6	18	57.5		171	30.5	290.1	21	20.1		159	23.8	289.7	22	46.5	
20	219	44.6		7	51.0	3.7	209	29.8		12	5.2	3.3	198	55.7		15	51.2	2.9	187	54.4		18	59.8	2.3	176	20.6		21	21.7	1.6	164	13.5		22	47.3	0.7
40	224	36.2		7	54.7		214	21.1		12	8.6		203	46.7		15	54.1		192	45.0		19	2.1		181	10.8		21	23.3		169	3.1		22	48.0	
18 0	229	27.7	291.5	7	58.4		219	12.5	291.3	12	11.9		208	37.7	291.0	15	57.0		197	35.6	290.6	19	4.4		186	0.9	290.1	21	24.9		173	52.8	289.7	22	48.7	
20	234	19.3		8	2.1	3.7	224	3.8		12	15.3	3.3	213	28.7		15	59.8	2.9	202	26.1		19	6.7	2.3	190	51.0		21	26.5	1.6	178	42.5		22	49.5	0.7
40	239	10.8		8	5.7		228	55.2		12	18.6		218	19.7		16	2.7		207	16.7		19	9.0		195	41.1		21	28.1		183	32.1		22	50.2	
19 0	244	2.3	291.5	8	9.4		233	46.5	291.3	12	21.9		223	10.7	291.0	16	5.6		212	7.3	290.6	19	11.3		200	31.2	290.1	21	29.6		188	21.8	289.6	22	50.9	
20	248	53.9		8	13.1	3.7	238	37.8		12	25.3	3.3	228	1.7		16	8.4	2.8	216	57.9		19	13.6	2.3	205	21.3		21	31.2	1.5	193	11.4		22	51.6	0.7
40	253	45.4		8	16.7		243	29.1		12	28.6		232	52.7		16	11.3		221	48.4		19	15.8		210	11.4		21	32.7		198	1.1		22	52.2	
20 0	258	37.0	291.5	8	20.4		248	20.5	291.3	12	31.9		237	43.7	291.0	16	14.1		226	39.0	290.5	19	18.1		215	1.5	290.1	21	34.2		202	50.7	289.6	22	52.9	
20	263	28.5		8	24.0	3.6	253	11.8		12	35.2	3.3	242	34.7		16	17.0	2.8	231	29.5		19	20.3	2.2	219	51.6		21	35.7	1.5	207	40.4		22	53.5	0.6
40	268	20.0		8	27.7		258	3.1		12	38.5		247	25.6		16	19.8		236	20.0		19	22.6		224	41.6		21	37.2		212	30.0		22	54.2	
21 0	273	11.6	291.5	8	31.3		262	54.4	291.3	12	41.8		252	16.6	290.9	16	22.6		241	10.6	290.5	19	24.8		229	31.7	290.0	21	38.7		217	19.6	289.6	22	54.8	
20	278	3.1		8	35.0	3.6	267	45.7		12	45.1	3.3	257	7.6		16	25.5	2.8	246	1.1		19	27.0	2.2	234	21.7		21	40.2	1.5	222	9.2		22	55.4	0.6
40	282	54.6		8	38.6		272	37.0		12	48.4		261	58.5		16	28.3		250	51.6		19	29.2		239	11.8		21	41.6		226	58.8		22	56.0	
22 0	287	46.1	291.5	8	42.2		277	28.3	291.3	12	51.7		266	49.5	290.9	16	31.1		255	42.1	290.5	19	31.4		244	1.8	290.0	21	43.1		231	48.4	289.6	22	56.6	
20	292	37.7		8	45.9	3.6	282	19.6		12	54.9	3.3	271	40.4		16	33.9	2.8	260	32.6		19	33.6	2.2	248	51.9		21	44.5	1.4	236	38.0		22	57.1	0.5
40	297	29.2		8	49.5		287	10.9		12	58.2		276	31.3		16	36.6		265	23.1		19	35.7		253	41.9		21	46.0		241	27.6		22	57.7	
23 0	302	20.7	291.5	8	53.1		292	2.1	291.3	13	1.5		281	22.3	290.9	16	39.4		270	13.6	290.5	19	37.9		258	31.9	290.0	21	47.4		246	17.2	289.6	22	58.2	
20	307	12.2		8	56.7	3.6	296	53.4		13	4.7	3.2	286	13.2		16	42.2	2.8	275	4.1		19	40.1	2.2	263	21.9		21	48.8	1.4	251	6.8		22	58.7	0.5
40	312	3.7		9	0.4		301	44.7		13	8.0		291	4.1		16	45.0		279	54.6		19	42.2		268	11.9		21	50.2		255	56.4		22	59.3	

2011 Moon

h m	23 Aug GHA ° '	d	Dec ° '	d '	24 Aug GHA ° '	d	Dec ° '	d '	25 Aug GHA ° '	d	Dec ° '	d '	26 Aug GHA ° '	d	Dec ° '	d '	27 Aug GHA ° '	d	Dec ° '	d '	28 Aug GHA ° '	d	Dec ° '	d '
0 0	260 45.9	289.6	22 59.8	0.5	248 2.5	289.2	23 0.5	-0.5	235 1.3	289.1	21 48.0	-1.6	221 53.8	289.1	19 20.8	-2.6	208 49.8	289.2	15 43.1	-3.5	195 54.6	289.3	11 5.3	-4.2
20	265 35.5		23 0.3		252 51.7		23 0.0		239 50.3		21 46.4		226 42.9		19 18.2		213 39.0		15 39.6		200 43.9		11 1.1	
40	270 25.1		23 0.7		257 41.0		22 59.5		244 39.4		21 44.9		231 31.9		19 15.6		218 28.2		15 36.1		205 33.2		10 56.8	
1 0	275 14.6	289.5	23 1.2	0.4	262 30.2	289.2	22 59.0	-0.6	249 28.5	289.1	21 43.3	-1.6	236 21.0	289.1	19 13.0	-2.6	223 17.4	289.2	15 32.6	-3.5	210 22.5	289.3	10 52.6	-4.2
20	280 4.2		23 1.6		267 19.4		22 58.4		254 17.6		21 41.7		241 10.1		19 10.4		228 6.5		15 29.1		215 11.9		10 48.4	
40	284 53.7		23 2.1		272 8.7		22 57.9		259 6.6		21 40.1		245 59.1		19 7.8		232 55.7		15 25.6		220 1.2		10 44.1	
2 0	289 43.3	289.5	23 2.5	0.4	276 57.9	289.2	22 57.3	-0.6	263 55.7	289.1	21 38.5	-1.6	250 48.2	289.1	19 5.2	-2.7	237 44.9	289.2	15 22.1	-3.6	224 50.5	289.3	10 39.9	-4.3
20	294 32.8		23 2.9		281 47.1		22 56.7		268 44.8		21 36.9		255 37.3		19 2.6		242 34.1		15 18.5		229 39.8		10 35.6	
40	299 22.3		23 3.3		286 36.4		22 56.1		273 33.9		21 35.3		260 26.4		18 59.9		247 23.2		15 15.0		234 29.1		10 31.3	
3 0	304 11.9	289.5	23 3.7	0.4	291 25.6	289.2	22 55.5	-0.6	278 22.9	289.1	21 33.6	-1.7	265 15.4	289.1	18 57.2	-2.7	252 12.4	289.2	15 11.4	-3.6	239 18.4	289.3	10 27.0	-4.3
20	309 1.4		23 4.1		296 14.8		22 54.9		283 12.0		21 31.9		270 4.5		18 54.6		257 1.6		15 7.8		244 7.7		10 22.7	
40	313 50.9		23 4.4		301 4.0		22 54.3		288 1.1		21 30.3		274 53.6		18 51.9		261 50.8		15 4.2		248 57.0		10 18.5	
4 0	318 40.4	289.5	23 4.8	0.3	305 53.2	289.2	22 53.6	-0.7	292 50.1	289.1	21 28.6	-1.7	279 42.7	289.1	18 49.2	-2.7	266 40.0	289.2	15 0.6	-3.6	253 46.3	289.3	10 14.1	-4.3
20	323 29.9		23 5.1		310 42.4		22 52.9		297 39.2		21 26.9		284 31.8		18 46.4		271 29.2		14 57.0		258 35.7		10 9.8	
40	328 19.4		23 5.4		315 31.6		22 52.3		302 28.3		21 25.1		289 20.8		18 43.7		276 18.4		14 53.4		263 25.0		10 5.5	
5 0	333 8.9	289.5	23 5.7	0.3	320 20.8	289.2	22 51.6	-0.7	307 17.3	289.1	21 23.4	-1.8	294 9.9	289.1	18 41.0	-2.8	281 7.6	289.2	14 49.7	-3.6	268 14.3	289.3	10 1.2	-4.4
20	337 58.4		23 6.0		325 10.0		22 50.8		312 6.4		21 21.6		298 59.0		18 38.2		285 56.7		14 46.1		273 3.6		9 56.8	
40	342 47.9		23 6.3		329 59.2		22 50.1		316 55.5		21 19.9		303 48.1		18 35.4		290 45.9		14 42.4		277 53.0		9 52.5	
6 0	347 37.3	289.5	23 6.6	0.2	334 48.4	289.2	22 49.4	-0.8	321 44.5	289.1	21 18.1	-1.8	308 37.2	289.1	18 32.6	-2.8	295 35.1	289.2	14 38.8	-3.7	282 42.3	289.3	9 48.1	-4.4
20	352 26.8		23 6.8		339 37.6		22 48.6		326 33.6		21 16.3		313 26.3		18 29.8		300 24.3		14 35.1		287 31.6		9 43.8	
40	357 16.3		23 7.1		344 26.8		22 47.9		331 22.7		21 14.5		318 15.3		18 27.0		305 13.5		14 31.4		292 20.9		9 39.4	
7 0	2 5.7	289.5	23 7.3	0.2	349 16.0	289.2	22 47.1	-0.8	336 11.7	289.1	21 12.7	-1.9	323 4.4	289.1	18 24.2	-2.9	310 2.8	289.2	14 27.7	-3.7	297 10.3	289.3	9 35.0	-4.4
20	6 55.2		23 7.5		354 5.1		22 46.3		341 0.8		21 10.8		327 53.5		18 21.4		314 52.0		14 24.0		301 59.6		9 30.7	
40	11 44.7		23 7.7		358 54.3		22 45.5		345 49.9		21 9.0		332 42.6		18 18.5		319 41.2		14 20.2		306 48.9		9 26.3	
8 0	16 34.1	289.4	23 7.9	0.1	3 43.5	289.2	22 44.6	-0.8	350 38.9	289.1	21 7.1	-1.9	337 31.7	289.1	18 15.6	-2.9	324 30.4	289.2	14 16.5	-3.8	311 38.3	289.3	9 21.9	-4.4
20	21 23.5		23 8.0		8 32.7		22 43.8		355 28.0		21 5.2		342 20.8		18 12.8		329 19.6		14 12.8		316 27.6		9 17.5	
40	26 13.0		23 8.2		13 21.8		22 42.9		0 17.0		21 3.3		347 9.9		18 9.9		334 8.8		14 9.0		321 16.9		9 13.0	
9 0	31 2.4	289.4	23 8.3	0.1	18 11.0	289.2	22 42.1	-0.9	5 6.1	289.1	21 1.4	-1.9	351 59.0	289.1	18 7.0	-2.9	338 58.0	289.2	14 5.2	-3.8	326 6.3	289.3	9 8.6	-4.4
20	35 51.9		23 8.5		23 0.2		22 41.2		9 55.2		20 59.5		356 48.1		18 4.1		343 47.2		14 1.5		330 55.6		9 4.2	
40	40 41.3		23 8.6		27 49.3		22 40.3		14 44.2		20 57.5		1 37.2		18 1.1		348 36.5		13 57.7		335 45.0		8 59.8	
10 0	45 30.7	289.4	23 8.7	0.1	32 38.5	289.2	22 39.4	-0.9	19 33.3	289.1	20 55.6	-2.0	6 26.3	289.1	17 58.2	-3.0	353 25.7	289.2	13 53.9	-3.8	340 34.3	289.3	8 55.3	-4.5
20	50 20.1		23 8.8		37 27.6		22 38.5		24 22.3		20 53.6		11 15.4		17 55.2		358 14.9		13 50.1		345 23.7		8 50.9	
40	55 9.5		23 8.9		42 16.8		22 37.5		29 11.4		20 51.6		16 4.5		17 52.2		3 4.1		13 46.2		350 13.0		8 46.4	
11 0	59 58.9	289.4	23 8.9	0.0	47 5.9	289.1	22 36.6	-1.0	34 0.4	289.1	20 49.6	-2.0	20 53.6	289.1	17 49.3	-3.0	7 53.4	289.2	13 42.4	-3.9	355 2.3	289.3	8 41.9	-4.5
20	64 48.3		23 9.0		51 55.1		22 35.6		38 49.5		20 47.6		25 42.7		17 46.3		12 42.6		13 38.6		359 51.7		8 37.5	
40	69 37.7		23 9.0		56 44.2		22 34.6		43 38.6		20 45.6		30 31.8		17 43.3		17 31.8		13 34.7		4 41.0		8 33.0	
12 0	74 27.1	289.4	23 9.0	0.0	61 33.4	289.1	22 33.6	-1.0	48 27.6	289.1	20 43.6	-2.1	35 20.9	289.1	17 40.2	-3.0	22 21.0	289.2	13 30.8	-3.9	9 30.4	289.4	8 28.5	-4.5
20	79 16.5		23 9.0		66 22.5		22 32.6		53 16.7		20 41.5		40 10.0		17 37.2		27 10.3		13 27.0		14 19.7		8 24.0	
40	84 5.9		23 9.0		71 11.7		22 31.6		58 5.7		20 39.4		44 59.1		17 34.2		31 59.5		13 23.1		19 9.1		8 19.5	
13 0	88 55.3	289.4	23 9.0	0.0	76 0.8	289.1	22 30.5	-1.1	62 54.8	289.1	20 37.4	-2.1	49 48.3	289.1	17 31.1	-3.1	36 48.8	289.2	13 19.2	-3.9	23 58.5	289.4	8 15.0	-4.5
20	93 44.6		23 9.0		80 49.9		22 29.5		67 43.8		20 35.3		54 37.4		17 28.0		41 38.0		13 15.3		28 47.8		8 10.5	
40	98 34.0		23 8.9		85 39.1		22 28.4		72 32.9		20 33.2		59 26.5		17 24.9		46 27.2		13 11.4		33 37.2		8 6.0	
14 0	103 23.4	289.4	23 8.9	-0.1	90 28.2	289.1	22 27.3	-1.1	77 22.0	289.1	20 31.0	-2.1	64 15.6	289.1	17 21.8	-3.1	51 16.5	289.2	13 7.5	-4.0	38 26.5	289.4	8 1.5	-4.6
20	108 12.7		23 8.8		95 17.3		22 26.2		82 11.0		20 28.9		69 4.7		17 18.7		56 5.7		13 3.5		43 15.9		7 56.9	
40	113 2.1		23 8.7		100 6.4		22 25.1		87 0.1		20 26.7		73 53.8		17 15.6		60 55.0		12 59.6		48 5.2		7 52.4	
15 0	117 51.5	289.3	23 8.6	-0.1	104 55.6	289.1	22 24.0	-1.2	91 49.1	289.1	20 24.6	-2.2	78 43.0	289.1	17 12.5	-3.2	65 44.2	289.3	12 55.6	-4.0	52 54.6	289.4	7 47.8	-4.5
20	122 40.8		23 8.5		109 44.7		22 22.8		96 38.2		20 22.4		83 32.1		17 9.3		70 33.5		12 51.7		57 44.0		7 43.3	
40	127 30.2		23 8.3		114 33.8		22 21.7		101 27.2		20 20.2		88 21.2		17 6.1		75 22.7		12 47.7		62 33.3		7 38.7	
16 0	132 19.5	289.3	23 8.2	-0.2	119 22.9	289.1	22 20.5	-1.2	106 16.3	289.1	20 18.0	-2.2	93 10.3	289.1	17 3.0	-3.2	80 12.0	289.3	12 43.7	-4.0	67 22.7	289.4	7 34.2	-4.6
20	137 8.8		23 8.0		124 12.0		22 19.3		111 5.4		20 15.8		97 59.5		16 59.8		85 1.2		12 39.7		72 12.1		7 29.6	
40	141 58.2		23 7.9		129 1.2		22 18.1		115 54.4		20 13.5		102 48.6		16 56.6		89 50.5		12 35.7		77 1.4		7 25.0	
17 0	146 47.5	289.3	23 7.7	-0.2	133 50.3	289.1	22 16.9	-1.3	120 43.5	289.1	20 11.3	-2.3	107 37.7	289.1	16 53.4	-3.2	94 39.8	289.3	12 31.7	-4.0	81 50.8	289.4	7 20.5	-4.6
20	151 36.8		23 7.5		138 39.4		22 15.6		125 32.5		20 9.0		112 26.8		16 50.1		99 29.0		12 27.7		86 40.2		7 15.9	
40	156 26.1		23 7.3		143 28.5		22 14.4		130 21.6		20 6.7		117 16.0		16 46.9		104 18.3		12 23.6		91 29.5		7 11.3	
18 0	161 15.5	289.3	23 7.0	-0.2	148 17.6	289.1	22 13.1	-1.3	135 10.6	289.1	20 4.4	-2.3	122 5.1	289.1	16 43.7	-3.3	109 7.6	289.3	12 19.6	-4.1	96 18.9	289.4	7 6.7	-4.6
20	166 4.8		23 6.8		153 6.7		22 11.9		139 59.7		20 2.1		126 54.3		16 40.4		113 56.8		12 15.5		101 8.3		7 2.1	
40	170 54.1		23 6.5		157 55.8		22 10.6		144 48.8		19 59.8		131 43.4		16 37.1		118 46.1		12 11.5		105 57.7		6 57.5	
19 0	175 43.4	289.3	23 6.3	-0.3	162 44.9	289.1	22 9.3	-1.3	149 37.8	289.1	19 57.5	-2.4	136 32.5	289.1	16 33.8	-3.3	123 35.4	289.3	12 7.4	-4.1	110 47.0	289.4	6 52.8	-4.6
20	180 32.7		23 6.0		167 34.0		22 7.9		154 26.9		19 55.1		141 21.7		16 30.5		128 24.6		12 3.3		115 36.4		6 48.2	
40	185 22.0		23 5.7		172 23.1		22 6.6		159 15.9		19 52.7		146 10.8		16 27.2		133 13.9		11 59.2		120 25.8		6 43.6	
20 0	190 11.3	289.3	23 5.4	-0.4	177 12.2	289.1	22 5.3	-1.4	164 5.0	289.1	19 50.4	-2.4	150 60.0	289.1	16 23.9	-3.3	138 3.2	289.3	11 55.2	-4.1	125 15.2	289.4	6 39.0	-4.7
20	195 0.6		23 5.0		182 1.3		22 3.9		168 54.1		19 48.0		155 49.1		16 20.6		142 52.5		11 51.0		130 4.5		6 34.3	
40	199 49.8		23 4.7		186 50.4		22 2.5		173 43.1		19 45.6		160 38.3		16 17.2		147 41.7		11 46.9		134 53.9		6 29.7	
21 0	204 39.1	289.3	23 4.3	-0.4	191 39.5	289.1	22 1.1	-1.4	178 32.2	289.1	19 43.2	-2.5	165 27.4	289.2	16 13.9	-3.4	152 31.0	289.3	11 42.8	-4.1	139 43.3	289.4	6 25.0	-4.6
20	209 28.4		23 4.0		196 28.6		21 59.7		183 21.3		19 40.7		170 16.6		16 10.5		157 20.3		11 38.7		144 32.7		6 20.4	
40	214 17.7		23 3.6		201 17.7		21 58.3		188 10.3		19 38.3		175 5.7		16 7.1		162 9.6		11 34.5		149 22.1		6 15.7	
22 0	219 6.9	289.3	23 3.2	-0.4	206 6.8	289.1	21 56.9	-1.5	192 59.4	289.1	19 35.8	-2.5	179 54.9	289.2	16 3.7	-3.4	166 58.9	289.3	11 30.4	-4.2	154 11.4	289.4	6 11.1	-4.7
20	223 56.2		23 2.8		210 55.8		21 55.4		197 48.4		19 33.3		184 44.0		16 0.3		171 48.2		11 26.2		159 0.8		6 6.4	
40	228 45.5		23 2.3		215 44.9		21 54.0		202 37.5		19 30.8		189 33.2		15 56.9		176 37.5		11 22.0		163 50.2		6 1.7	
23 0	233 34.7	289.3	23 1.9	-0.5	220 34.0	289.1	21 52.5	-1.5	207 26.6	289.1	19 28.3	-2.5	194 22.4	289.2	15 53.5	-3.5	181 26.8	289.3	11 17.9	-4.2	168 39.6	289.4	5 57.0	-4.7
20	238 24.0		23 1.5		225 23.1		21 51.0		212 15.7		19 25.8		199 11.5		15 50.0		186 16.1		11 13.7		173 29.0		5 52.4	
40	243 13.2		23 1.0		230 12.2		21 49.5		217 4.7		19 23.3		204 0.7		15 46.6		191 5.3		11 9.5		178 18.4		5 47.7	

2011 Moon

	29 Aug						30 Aug						31 Aug						1 Sep						2 Sep						3 Sep					
	GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec		
h m	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'
0 0	183	7.7	289.4	5	43.0	-4.7	170	23.8	289.4	-0	3.7	-4.9	157	34.6	289.2	-5	52.0	-4.7	144	31.5	289.0	-11	18.4	-4.3	131	8.8	288.7	-16	0.5	-3.5	117	26.2	288.5	-19	39.6	-2.5
20	187	57.1		5	38.3		175	13.2		-0	8.6		162	23.8		-5	56.7		149	20.5		-11	22.6		135	57.5		-16	4.0		122	14.7		-19	42.1	
40	192	46.5		5	33.6		180	2.5		-0	13.5		167	13.0		-6	1.5		154	9.5		-11	26.9		140	46.2		-16	7.5		127	3.1		-19	44.6	
1 0	197	35.9	289.4	5	28.9	-4.7	184	51.9	289.4	-0	18.4	-4.9	172	2.3	289.2	-6	6.2	-4.7	158	58.5	289.0	-11	31.2	-4.2	145	34.9	288.7	-16	11.0	-3.5	131	51.6	288.4	-19	47.1	-2.5
20	202	25.3		5	24.2		189	41.3		-0	23.2		176	51.5		-6	10.9		163	47.5		-11	35.4		150	23.6		-16	14.5		136	40.0		-19	49.6	
40	207	14.7		5	19.4		194	30.6		-0	28.1		181	40.7		-6	15.6		168	36.5		-11	39.6		155	12.3		-16	18.0		141	28.5		-19	52.1	
2 0	212	4.1	289.4	5	14.7	-4.7	199	20.0	289.4	-0	33.0	-4.9	186	29.9	289.2	-6	20.4	-4.7	173	25.4	289.0	-11	43.9	-4.2	160	1.0	288.7	-16	21.4	-3.4	146	16.9	288.4	-19	54.5	-2.4
20	216	53.5		5	10.0		204	9.4		-0	37.9		191	19.2		-6	25.1		178	14.4		-11	48.1		164	49.7		-16	24.9		151	5.4		-19	56.9	
40	221	42.8		5	5.3		208	58.7		-0	42.8		196	8.4		-6	29.8		183	3.4		-11	52.3		169	38.4		-16	28.3		155	53.8		-19	59.4	
3 0	226	32.2	289.4	5	0.5	-4.7	213	48.1	289.4	-0	47.6	-4.9	200	57.6	289.2	-6	34.5	-4.7	187	52.3	289.0	-11	56.5	-4.2	174	27.0	288.7	-16	31.7	-3.4	160	42.2	288.4	-20	1.8	-2.4
20	231	21.6		4	55.8		218	37.5		-0	52.5		205	46.8		-6	39.2		192	41.3		-12	0.7		179	15.7		-16	35.1		165	30.7		-20	4.2	
40	236	11.0		4	51.0		223	26.8		-0	57.4		210	36.0		-6	43.9		197	30.2		-12	4.9		184	4.4		-16	38.5		170	19.1		-20	6.5	
4 0	241	0.4	289.4	4	46.3	-4.8	228	16.2	289.4	-1	2.3	-4.9	215	25.2	289.2	-6	48.6	-4.7	202	19.2	288.9	-12	9.0	-4.2	188	53.0	288.7	-16	41.9	-3.3	175	7.5	288.4	-20	8.9	-2.3
20	245	49.8		4	41.5		233	5.6		-1	7.2		220	14.4		-6	53.2		207	8.1		-12	13.2		193	41.7		-16	45.2		179	56.0		-20	11.2	
40	250	39.2		4	36.8		237	54.9		-1	12.0		225	3.6		-6	57.9		211	57.1		-12	17.3		198	30.3		-16	48.6		184	44.4		-20	13.6	
5 0	255	28.6	289.4	4	32.0	-4.8	242	44.3	289.4	-1	16.9	-4.9	229	52.8	289.2	-7	2.6	-4.7	216	46.0	288.9	-12	21.5	-4.1	203	19.0	288.6	-16	51.9	-3.3	189	32.8	288.4	-20	15.9	-2.3
20	260	18.0		4	27.3		247	33.6		-1	21.8		234	42.0		-7	7.2		221	35.0		-12	25.6		208	7.6		-16	55.2		194	21.2		-20	18.2	
40	265	7.4		4	22.5		252	23.0		-1	26.7		239	31.2		-7	11.9		226	23.9		-12	29.8		212	56.3		-16	58.5		199	9.7		-20	20.5	
6 0	269	56.8	289.4	4	17.7	-4.8	257	12.3	289.3	-1	31.6	-4.9	244	20.4	289.2	-7	16.6	-4.6	231	12.8	288.9	-12	33.9	-4.1	217	44.9	288.6	-17	1.8	-3.3	203	58.1	288.4	-20	22.7	-2.3
20	274	46.2		4	13.0		262	1.7		-1	36.4		249	9.6		-7	21.2		236	1.7		-12	38.0		222	33.5		-17	5.1		208	46.5		-20	25.0	
40	279	35.6		4	8.2		266	51.0		-1	41.3		253	58.8		-7	25.9		240	50.7		-12	42.1		227	22.2		-17	8.4		213	34.9		-20	27.2	
7 0	284	24.9	289.4	4	3.4	-4.8	271	40.4	289.3	-1	46.2	-4.9	258	47.9	289.2	-7	30.5	-4.6	245	39.6	288.9	-12	46.2	-4.1	232	10.8	288.6	-17	11.7	-3.2	218	23.3	288.4	-20	29.5	-2.2
20	289	14.3		3	58.6		276	29.7		-1	51.1		263	37.1		-7	35.1		250	28.5		-12	50.2		236	59.4		-17	14.9		223	11.7		-20	31.7	
40	294	3.7		3	53.8		281	19.1		-1	55.9		268	26.3		-7	39.8		255	17.4		-12	54.3		241	48.0		-17	18.1		228	0.1		-20	33.9	
8 0	298	53.1	289.4	3	49.0	-4.8	286	8.4	289.3	-2	0.8	-4.9	273	15.4	289.2	-7	44.4	-4.6	260	6.3	288.9	-12	58.4	-4.0	246	36.7	288.6	-17	21.4	-3.2	232	48.5	288.4	-20	36.0	-2.2
20	303	42.5		3	44.2		290	57.7		-2	5.7		278	4.6		-7	49.0		264	55.2		-13	2.4		251	25.3		-17	24.6		237	37.0		-20	38.2	
40	308	31.9		3	39.4		295	47.1		-2	10.5		282	53.8		-7	53.6		269	44.1		-13	6.4		256	13.9		-17	27.8		242	25.4		-20	40.3	
9 0	313	21.3	289.4	3	34.6	-4.8	300	36.4	289.3	-2	15.4	-4.9	287	42.9	289.2	-7	58.2	-4.6	274	33.0	288.9	-13	10.5	-4.0	261	2.5	288.6	-17	30.9	-3.2	247	13.8	288.4	-20	42.5	-2.1
20	318	10.7		3	29.8		305	25.8		-2	20.3		292	32.1		-8	2.8		279	21.9		-13	14.5		265	51.1		-17	34.1		252	2.2		-20	44.6	
40	323	0.1		3	25.0		310	15.1		-2	25.1		297	21.2		-8	7.4		284	10.8		-13	18.5		270	39.7		-17	37.2		256	50.6		-20	46.7	
10 0	327	49.5	289.4	3	20.2	-4.8	315	4.4	289.3	-2	30.0	-4.9	302	10.4	289.1	-8	12.0	-4.6	288	59.6	288.9	-13	22.5	-4.0	275	28.3	288.6	-17	40.4	-3.1	261	38.9	288.4	-20	48.8	-2.0
20	332	38.9		3	15.4		319	53.8		-2	34.9		306	59.5		-8	16.6		293	48.5		-13	26.5		280	16.9		-17	43.5		266	27.3		-20	50.8	
40	337	28.3		3	10.6		324	43.1		-2	39.7		311	48.7		-8	21.1		298	37.4		-13	30.5		285	5.4		-17	46.6		271	15.7		-20	52.9	
11 0	342	17.7	289.4	3	5.8	-4.8	329	32.4	289.3	-2	44.6	-4.8	316	37.8	289.1	-8	25.7	-4.6	303	26.2	288.9	-13	34.4	-4.0	289	54.0	288.6	-17	49.7	-3.1	276	4.1	288.4	-20	54.9	-2.0
20	347	7.1		3	1.0		334	21.7		-2	49.4		321	27.0		-8	30.3		308	15.1		-13	38.4		294	42.6		-17	52.8		280	52.5		-20	56.9	
40	351	56.5		2	56.1		339	11.1		-2	54.3		326	16.1		-8	34.8		313	4.0		-13	42.3		299	31.2		-17	55.9		285	40.9		-20	58.9	
12 0	356	45.9	289.4	2	51.3	-4.8	344	0.4	289.3	-2	59.1	-4.9	331	5.2	289.1	-8	39.4	-4.5	317	52.8	288.8	-13	46.3	-3.9	304	19.8	288.6	-17	58.9	-3.0	290	29.3	288.4	-21	0.9	-2.0
20	1	35.3		2	46.5		348	49.7		-3	4.0		335	54.4		-8	43.9		322	41.7		-13	50.2		309	8.3		-18	2.0		295	17.7		-21	2.9	
40	6	24.7		2	41.6		353	39.0		-3	8.8		340	43.5		-8	48.5		327	30.5		-13	54.1		313	56.9		-18	5.0		300	6.1		-21	4.9	
13 0	11	14.1	289.4	2	36.8	-4.8	358	28.3	289.3	-3	13.7	-4.8	345	32.6	289.1	-8	53.0	-4.5	332	19.4	288.8	-13	58.0	-3.9	318	45.4	288.6	-18	8.0	-3.0	304	54.4	288.4	-21	6.8	-1.9
20	16	3.4		2	32.0		3	17.7		-3	18.5		350	21.7		-8	57.5		337	8.2		-14	1.9		323	34.0		-18	11.0		309	42.8		-21	8.7	
40	20	52.8		2	27.1		8	7.0		-3	23.4		355	10.8		-9	2.0		341	57.0		-14	5.8		328	22.6		-18	14.0		314	31.2		-21	10.6	
14 0	25	42.2	289.4	2	22.3	-4.9	12	56.3	289.3	-3	28.2	-4.8	359	59.9	289.1	-9	6.5	-4.5	346	45.9	288.8	-14	9.7	-3.8	333	11.1	288.5	-18	17.0	-2.9	319	19.6	288.4	-21	12.5	-1.9
20	30	31.6		2	17.4		17	45.6		-3	33.0		4	49.0		-9	11.0		351	34.7		-14	13.5		337	59.7		-18	19.9		324	8.0		-21	14.4	
40	35	21.0		2	12.6		22	34.9		-3	37.9		9	38.1		-9	15.5		356	23.5		-14	17.4		342	48.2		-18	22.9		328	56.3		-21	16.3	
15 0	40	10.4	289.4	2	7.7	-4.8	27	24.2	289.3	-3	42.7	-4.8	14	27.2	289.1	-9	20.0	-4.5	1	12.3	288.8	-14	21.2	-3.8	347	36.7	288.5	-18	25.8	-2.9	333	44.7	288.4	-21	18.1	-1.8
20	44	59.8		2	2.9		32	13.5		-3	47.5		19	16.3		-9	24.5		6	1.1		-14	25.0		352	25.3		-18	28.7		338	33.1		-21	20.0	
40	49	49.2		1	58.0		37	2.8		-3	52.4		24	5.4		-9	29.0		10	49.9		-14	28.8		357	13.8		-18	31.6		343	21.5		-21	21.8	
16 0	54	38.6	289.4	1	53.2	-4.9	41	52.1	289.3	-3	57.2	-4.8	28	54.5	289.1	-9	33.4	-4.5	15	38.7	288.8	-14	32.6	-3.8	2	2.4	288.5	-18	34.5	-2.9	348	9.8	288.4	-21	23.6	-1.8
20	59	28.0		1	48.3		46	41.4		-4	2.0		33	43.6		-9	37.9		20	27.5		-14	36.4		6	50.9		-18	37.4		352	58.2		-21	25.4	
40	64	17.4		1	43.5		51	30.7		-4	6.8		38	32.7		-9	42.4		25	16.3		-14	40.2		11	39.4		-18	40.3		357	46.6		-21	27.1	
17 0	69	6.8	289.4	1	38.6	-4.9	56	20.0	289.3	-4	11.6	-4.8	43	21.8	289.1	-9	46.8	-4.4	30	5.1	288.8	-14	44.0	-3.7	16	27.9	288.5	-18	43.1	-2.8	2	35.0	288.4	-21	28.9	-1.7
20	73	56.1		1	33.8		61	9.3		-4	16.5		48	10.8		-9	51.2		34	53.9		-14	47.8		21	16.4		-18	46.0		7	23.3		-21	30.6	
40	78	45.5		1	28.9		65	58.6		-4	21.3		52	59.9		-9	55.7		39	42.7		-14	51.5		26	5.0		-18	48.8		12	11.7		-21	32.3	
18 0	83	34.9	289.4	1	24.0	-4.9	70	47.8	289.3	-4	26.1	-4.8	57	49.0	289.1	-10	0.1	-4.4	44	31.5	288.8	-14	55.2	-3.7	30	53.5	288.5	-18	51.6	-2.8	17	0.1	288.4	-21	34.0	-1.7
20	88	24.3		1	19.2		75	37.1		-4	30.9		62	38.0		-10	4.5		49	20.3		-14	59.0		35	42.0		-18	54.4		21	48.4		-21	35.7	
40	93	13.7		1	14.3		80	26.4		-4	35.7		67	27.1		-10	8.9		54	9.0		-15	2.7		40	30.5		-18	57.1		26	36.8		-21	37.4	
19 0	98	3.1	289.4	1	9.4	-4.9	85	15.7	289.3	-4	40.5	-4.8	72	16.1	289.0	-10	13.3	-4.4	58	57.8	288.8	-15	6.4	-3.7	45	19.0	288.5	-18	59.9	-2.7	31	25.2	288.4	-21	39.0	-1.6
20	102	52.5		1	4.6		90	5.0		-4	45.3		77	5.2		-10	17.7		63	46.6		-15	10.1		50	7.5		-19	2.7		36	13.5		-21	40.7	
40	107	41.9		0	59.7		94	54.2		-4	50.1		81	54.2		-10	22.1		68	35.3		-15	13.8		54	56.0		-19	5.4		41	1.9		-21	42.3	
20 0	112	31.2	289.4	0	54.8	-4.9	99	43.5	289.3	-4	54.8	-4.8	86	43.3	289.0	-10	26.5	-4.4	73	24.1	288.7	-15	17.4	-3.7	59	44.5	288.5	-19	8.1	-2.7	45	50.3	288.4	-21	43.9	-1.6
20	117	20.6		0	49.9		104	32.8		-4	59.6		91	32.3		-10	30.8		78	12.8		-15	21.1		64	33.0		-19	10.8		50	38.6		-21	45.5	
40	122	10.0		0	45.1		109	22.0		-5	4.4		96	21.4		-10	35.2		83	1.6		-15	24.7		69	21.5		-19	13.5		55	27.0		-21	47.1	
21 0	126	59.4	289.4	0	40.2	-4.9	114	11.3	289.3	-5	9.2	-4.8	101	10.4	289.0	-10	39.6	-4.3	87	50.3	288.7	-15	28.4	-3.6	74	10.0	288.5	-19	16.2	-2.6	60	15.4	288.4	-21	48.6	-1.5
20	131	48.8		0	35.3		119	0.6		-5	14.0		105	59.4		-10	43.9		92	39.1		-15	32.0		78	58.4		-19	18.8		65	3.7		-21	50.2	
40	136	38.2		0	30.4		123	49.8		-5	18.7		110	48.5		-10	48.2		97	27.8		-15	35.6		83	46.9		-19	21.5		69	52.1		-21	51.7	
22 0	141	27.5	289.4	0	25.6	-4.9	128	39.1	289.2	-5	23.5	-4.8	115	37.5	289.0	-10	52.6	-4.3	102	16.5	288.7	-15	39.2	-3.6	88	35.4	288.5	-19	24.1	-2.6	74	40.4	288.4	-21	53.2	-1.5
20	146	16.9		0	20.7		133	28.3		-5	28.3		120	26.5		-10	56.9		107	5.3		-15	42.8		93	23.9		-19	26.7		79	28.8		-21	54.7	
40	151	6.3		0	15.8		138	17.6		-5	33.0		125	15.5		-11	1.2		111	54.0		-15	46.4		98	12.3		-19	29.3		84	17.2		-21	56.2	
23 0	155	55.7	289.4	0	10.9	-4.9	143	6.8	289.2	-5	37.8	-4.7	130	4.5	289.0	-11	5.5	-4.3	116	42.7	288.7	-15	49.9	-3.5	103	0.8	288.5	-19	31.9	-2.6	89	5.5	288.4	-21	57.7	-1.4
20	160	45.0		0	6.1		147	56.1		-5	42.5		134	53.5		-11	9.8		121	31.4		-15	53.5		107	49.3		-19	34.5		93	53.9		-21	59.1	
40	165	34.4		0	1.2		152	45.3		-5	47.3		139	42.5		-11	14.1		126	20.1		-15	57.0		112	37.7		-19	37.0		98	42.3		-22	0.5	

2011 Moon

h m	4 Sep GHA ° ′	d	Dec ° ′	d′	5 Sep GHA ° ′	d	Dec ° ′	d′	6 Sep GHA ° ′	d	Dec ° ′	d′	7 Sep GHA ° ′	d	Dec ° ′	d′	8 Sep GHA ° ′	d	Dec ° ′	d′	9 Sep GHA ° ′	d	Dec ° ′	d′
0 0	103 30.6	288.4	-22 1.9	-1.4	89 35.8	288.5	-23 1.1	-0.2	75 58.5	288.9	-22 37.8	0.9	62 53.1	289.4	-20 59.5	1.8	50 28.3	290.0	-18 18.0	2.6	38 45.5	290.5	-14 46.9	3.2
20	108 19.0		-22 3.3		94 24.3		-23 1.3		80 47.3		-22 36.9		67 42.5		-20 57.7		55 18.3		-18 15.4		43 36.0		-14 43.7	
40	113 7.3		-22 4.7		99 12.8		-23 1.5		85 36.2		-22 36.0		72 31.9		-20 55.8		60 8.2		-18 12.7		48 26.6		-14 40.5	
1 0	117 55.7	288.4	-22 6.1	-1.3	104 1.3	288.5	-23 1.7	-0.2	90 25.0	288.9	-22 35.1	0.9	77 21.3	289.4	-20 54.0	1.9	64 58.2	290.0	-18 10.1	2.7	53 17.1	290.5	-14 37.2	3.2
20	122 44.1		-22 7.4		108 49.8		-23 1.9		95 13.9		-22 34.2		82 10.6		-20 52.1		69 48.2		-18 7.4		58 7.6		-14 34.0	
40	127 32.4		-22 8.8		113 38.3		-23 2.1		100 2.8		-22 33.3		87 0.0		-20 50.2		74 38.2		-18 4.8		62 58.2		-14 30.8	
2 0	132 20.8	288.4	-22 10.1	-1.3	118 26.8	288.5	-23 2.2	-0.1	104 51.6	288.9	-22 32.3	1.0	91 49.5	289.4	-20 48.3	1.9	79 28.2	290.0	-18 2.1	2.7	67 48.7	290.6	-14 27.5	3.3
20	137 9.2		-22 11.4		123 15.3		-23 2.3		109 40.5		-22 31.4		96 38.9		-20 46.4		84 18.2		-17 59.4		72 39.3		-14 24.3	
40	141 57.5		-22 12.7		128 3.8		-23 2.5		114 29.4		-22 30.4		101 28.3		-20 44.4		89 8.2		-17 56.7		77 29.9		-14 21.0	
3 0	146 45.9	288.4	-22 13.9	-1.2	132 52.3	288.5	-23 2.6	-0.1	119 18.3	288.9	-22 29.4	1.0	106 17.7	289.4	-20 42.5	2.0	93 58.2	290.0	-17 54.0	2.7	82 20.5	290.6	-14 17.7	3.3
20	151 34.3		-22 15.2		137 40.9		-23 2.6		124 7.2		-22 28.4		111 7.2		-20 40.6		98 48.3		-17 51.3		87 11.0		-14 14.5	
40	156 22.6		-22 16.4		142 29.4		-23 2.7		128 56.1		-22 27.4		115 56.6		-20 38.6		103 38.3		-17 48.6		92 1.6		-14 11.2	
4 0	161 11.0	288.4	-22 17.6	-1.2	147 17.9	288.5	-23 2.8	0.0	133 45.0	288.9	-22 26.3	1.0	120 46.1	289.5	-20 36.6	2.0	108 28.3	290.1	-17 45.9	2.8	96 52.2	290.6	-14 7.9	3.3
20	165 59.4		-22 18.9		152 6.5		-23 2.8		138 34.0		-22 25.3		125 35.5		-20 34.6		113 18.4		-17 43.1		101 42.8		-14 4.6	
40	170 47.7		-22 20.0		156 55.0		-23 2.8		143 22.9		-22 24.2		130 25.0		-20 32.6		118 8.4		-17 40.4		106 33.5		-14 1.3	
5 0	175 36.1	288.4	-22 21.2	-1.1	161 43.5	288.5	-23 2.8	0.0	148 11.8	289.0	-22 23.2	1.1	135 14.5	289.5	-20 30.6	2.0	122 58.5	290.1	-17 37.6	2.8	111 24.1	290.6	-13 58.0	3.3
20	180 24.5		-22 22.4		166 32.1		-23 2.8		153 0.8		-22 22.1		140 4.0		-20 28.6		127 48.6		-17 34.9		116 14.7		-13 54.7	
40	185 12.8		-22 23.5		171 20.6		-23 2.8		157 49.7		-22 21.0		144 53.5		-20 26.6		132 38.7		-17 32.1		121 5.3		-13 51.4	
6 0	190 1.2	288.4	-22 24.6	-1.1	176 9.2	288.6	-23 2.8	0.1	162 38.7	289.0	-22 19.8	1.1	149 43.0	289.5	-20 24.5	2.1	137 28.8	290.1	-17 29.3	2.8	125 56.0	290.7	-13 48.0	3.3
20	194 49.6		-22 25.7		180 57.8		-23 2.7		167 27.6		-22 18.7		154 32.5		-20 22.5		142 18.9		-17 26.5		130 46.6		-13 44.7	
40	199 38.0		-22 26.8		185 46.3		-23 2.7		172 16.6		-22 17.6		159 22.0		-20 20.4		147 9.0		-17 23.7		135 37.3		-13 41.4	
7 0	204 26.3	288.4	-22 27.9	-1.0	190 34.9	288.6	-23 2.6	0.1	177 5.6	289.0	-22 16.4	1.2	164 11.5	289.5	-20 18.3	2.1	151 59.1	290.1	-17 20.9	2.8	140 27.9	290.7	-13 38.0	3.4
20	209 14.7		-22 28.9		195 23.5		-23 2.5		181 54.6		-22 15.2		169 1.1		-20 16.3		156 49.2		-17 18.1		145 18.6		-13 34.7	
40	214 3.1		-22 30.0		200 12.0		-23 2.3		186 43.6		-22 14.0		173 50.6		-20 14.2		161 39.4		-17 15.3		150 9.3		-13 31.3	
8 0	218 51.5	288.4	-22 31.0	-1.0	205 0.6	288.6	-23 2.2	0.2	191 32.6	289.0	-22 12.8	1.2	178 40.2	289.6	-20 12.0	2.1	166 29.5	290.2	-17 12.4	2.8	154 60.0	290.7	-13 27.9	3.4
20	223 39.8		-22 32.0		209 49.2		-23 2.1		196 21.6		-22 11.6		183 29.7		-20 9.9		171 19.7		-17 9.6		159 50.7		-13 24.6	
40	228 28.2		-22 33.0		214 37.8		-23 1.9		201 10.6		-22 10.4		188 19.3		-20 7.8		176 9.8		-17 6.7		164 41.4		-13 21.2	
9 0	233 16.6	288.4	-22 34.0	-0.9	219 26.4	288.6	-23 1.7	0.2	205 59.6	289.0	-22 9.2	1.3	193 8.9	289.6	-20 5.6	2.2	180 60.0	290.2	-17 3.9	2.9	169 32.1	290.7	-13 17.8	3.4
20	238 5.0		-22 34.9		224 15.0		-23 1.5		210 48.6		-22 7.9		197 58.4		-20 3.5		185 50.2		-17 1.0		174 22.8		-13 14.4	
40	242 53.4		-22 35.9		229 3.6		-23 1.3		215 37.7		-22 6.6		202 48.0		-20 1.3		190 40.3		-16 58.1		179 13.5		-13 11.0	
10 0	247 41.7	288.4	-22 36.8	-0.9	233 52.2	288.6	-23 1.1	0.3	220 26.7	289.1	-22 5.4	1.3	207 37.6	289.6	-19 59.1	2.2	195 30.5	290.2	-16 55.3	2.9	184 4.2	290.7	-13 7.6	3.4
20	252 30.1		-22 37.7		238 40.8		-23 0.8		225 15.8		-22 4.1		212 27.2		-19 56.9		200 20.7		-16 52.4		188 54.9		-13 4.2	
40	257 18.5		-22 38.6		243 29.4		-23 0.6		230 4.8		-22 2.7		217 16.9		-19 54.7		205 10.9		-16 49.5		193 45.7		-13 0.8	
11 0	262 6.9	288.4	-22 39.5	-0.8	248 18.0	288.6	-23 0.3	0.3	234 53.9	289.1	-22 1.4	1.3	222 6.5	289.6	-19 52.5	2.2	210 1.1	290.2	-16 46.5	2.9	198 36.4	290.8	-12 57.4	3.4
20	266 55.3		-22 40.4		253 6.7		-23 0.0		239 42.9		-22 0.1		226 56.1		-19 50.3		214 51.4		-16 43.6		203 27.2		-12 54.0	
40	271 43.7		-22 41.2		257 55.3		-22 59.7		244 32.0		-21 58.7		231 45.8		-19 48.1		219 41.6		-16 40.7		208 17.9		-12 50.6	
12 0	276 32.1	288.4	-22 42.0	-0.8	262 43.9	288.6	-22 59.4	0.4	249 21.1	289.1	-21 57.4	1.4	236 35.4	289.7	-19 45.8	2.3	224 31.8	290.3	-16 37.8	3.0	213 8.7	290.8	-12 47.1	3.4
20	281 20.5		-22 42.8		267 32.6		-22 59.1		254 10.2		-21 56.0		241 25.1		-19 43.6		229 22.1		-16 34.8		217 59.5		-12 43.7	
40	286 8.9		-22 43.6		272 21.2		-22 58.7		258 59.3		-21 54.6		246 14.7		-19 41.3		234 12.3		-16 31.9		222 50.2		-12 40.2	
13 0	290 57.3	288.4	-22 44.4	-0.8	277 9.9	288.7	-22 58.3	0.4	263 48.4	289.1	-21 53.2	1.4	251 4.4	289.7	-19 39.0	2.3	239 2.6	290.3	-16 28.9	3.0	227 41.0	290.8	-12 36.8	3.5
20	295 45.7		-22 45.2		281 58.5		-22 58.0		268 37.5		-21 51.8		255 54.1		-19 36.7		243 52.9		-16 25.9		232 31.8		-12 33.3	
40	300 34.1		-22 45.9		286 47.2		-22 57.6		273 26.6		-21 50.3		260 43.8		-19 34.4		248 43.1		-16 23.0		237 22.6		-12 29.9	
14 0	305 22.5	288.4	-22 46.7	-0.7	291 35.9	288.7	-22 57.2	0.5	278 15.8	289.1	-21 48.9	1.5	265 33.5	289.7	-19 32.1	2.3	253 33.4	290.3	-16 20.0	3.0	242 13.4	290.8	-12 26.4	3.5
20	310 10.9		-22 47.4		296 24.5		-22 56.7		283 4.9		-21 47.4		270 23.2		-19 29.8		258 23.7		-16 17.0		247 4.2		-12 22.9	
40	314 59.3		-22 48.1		301 13.2		-22 56.3		287 54.0		-21 46.0		275 12.9		-19 27.5		263 14.0		-16 14.0		251 55.0		-12 19.5	
15 0	319 47.7	288.4	-22 48.8	-0.6	306 1.9	288.7	-22 55.8	0.5	292 43.2	289.2	-21 44.5	1.5	280 2.6	289.7	-19 25.1	2.4	268 4.3	290.3	-16 11.0	3.0	256 45.9	290.8	-12 16.0	3.5
20	324 36.1		-22 49.4		310 50.6		-22 55.3		297 32.3		-21 43.0		284 52.4		-19 22.8		272 54.6		-16 8.0		261 36.7		-12 12.5	
40	329 24.6		-22 50.1		315 39.3		-22 54.9		302 21.5		-21 41.5		289 42.1		-19 20.4		277 45.0		-16 4.9		266 27.5		-12 9.0	
16 0	334 13.0	288.4	-22 50.7	-0.6	320 28.0	288.7	-22 54.4	0.5	307 10.7	289.2	-21 39.9	1.5	294 31.9	289.8	-19 18.0	2.4	282 35.3	290.3	-16 1.9	3.0	271 18.4	290.9	-12 5.5	3.5
20	339 1.4		-22 51.3		325 16.7		-22 53.8		311 59.9		-21 38.4		299 21.6		-19 15.6		287 25.6		-15 58.9		276 9.2		-12 2.0	
40	343 49.8		-22 51.9		330 5.4		-22 53.3		316 49.1		-21 36.9		304 11.4		-19 13.2		292 16.0		-15 55.8		281 0.1		-11 58.5	
17 0	348 38.2	288.4	-22 52.5	-0.6	334 54.1	288.7	-22 52.8	0.6	321 38.2	289.2	-21 35.3	1.6	309 1.2	289.8	-19 10.8	2.4	297 6.3	290.4	-15 52.8	3.1	285 50.9	290.9	-11 55.0	3.5
20	353 26.7		-22 53.1		339 42.8		-22 52.2		326 27.4		-21 33.7		313 50.9		-19 8.4		301 56.7		-15 49.7		290 41.8		-11 51.5	
40	358 15.1		-22 53.6		344 31.6		-22 51.6		331 16.7		-21 32.1		318 40.7		-19 6.0		306 47.1		-15 46.6		295 32.7		-11 47.9	
18 0	3 3.5	288.4	-22 54.2	-0.5	349 20.3	288.7	-22 51.0	0.6	336 5.9	289.2	-21 30.5	1.6	323 30.5	289.8	-19 3.6	2.5	311 37.4	290.4	-15 43.6	3.1	300 23.6	290.9	-11 44.4	3.5
20	7 52.0		-22 54.7		354 9.0		-22 50.4		340 55.1		-21 28.9		328 20.3		-19 1.1		316 27.8		-15 40.5		305 14.4		-11 40.9	
40	12 40.4		-22 55.2		358 57.8		-22 49.8		345 44.3		-21 27.3		333 10.2		-18 58.7		321 18.2		-15 37.4		310 5.3		-11 37.3	
19 0	17 28.8	288.4	-22 55.7	-0.4	3 46.5	288.8	-22 49.1	0.7	350 33.6	289.3	-21 25.6	1.7	337 60.0	289.8	-18 56.2	2.5	326 8.6	290.4	-15 34.3	3.1	314 56.2	290.9	-11 33.8	3.6
20	22 17.3		-22 56.1		8 35.3		-22 48.5		355 22.8		-21 24.0		342 49.8		-18 53.7		330 59.0		-15 31.2		319 47.1		-11 30.3	
40	27 5.7		-22 56.6		13 24.0		-22 47.8		0 12.1		-21 22.3		347 39.7		-18 51.2		335 49.4		-15 28.1		324 38.0		-11 26.7	
20 0	31 54.2	288.5	-22 57.0	-0.4	18 12.8	288.8	-22 47.1	0.7	5 1.3	289.3	-21 20.6	1.7	352 29.5	289.9	-18 48.7	2.5	340 39.9	290.4	-15 24.9	3.1	329 29.0	290.9	-11 23.1	3.6
20	36 42.6		-22 57.5		23 1.6		-22 46.4		9 50.6		-21 18.9		357 19.4		-18 46.2		345 30.3		-15 21.8		334 19.9		-11 19.6	
40	41 31.1		-22 57.9		27 50.4		-22 45.7		14 39.9		-21 17.2		2 9.2		-18 43.7		350 20.7		-15 18.7		339 10.8		-11 16.0	
21 0	46 19.6	288.5	-22 58.3	-0.3	32 39.1	288.8	-22 45.0	0.8	19 29.2	289.3	-21 15.5	1.7	6 59.1	289.9	-18 41.2	2.6	355 11.2	290.5	-15 15.5	3.2	344 1.7	290.9	-11 12.4	3.6
20	51 8.0		-22 58.6		37 27.9		-22 44.3		24 18.5		-21 13.8		11 49.0		-18 38.6		0 1.6		-15 12.4		348 52.7		-11 8.9	
40	55 56.5		-22 59.0		42 16.7		-22 43.5		29 7.8		-21 12.1		16 38.9		-18 36.1		4 52.1		-15 9.2		353 43.6		-11 5.3	
22 0	60 44.9	288.5	-22 59.3	-0.3	47 5.5	288.8	-22 42.7	0.8	33 57.1	289.3	-21 10.3	1.8	21 28.8	289.9	-18 33.5	2.6	9 42.6	290.5	-15 6.0	3.2	358 34.6	291.0	-11 1.7	3.6
20	65 33.4		-22 59.7		51 54.3		-22 41.9		38 46.4		-21 8.5		26 18.7		-18 31.0		14 33.0		-15 2.9		3 25.5		-10 58.1	
40	70 21.9		-23 0.0		56 43.1		-22 41.1		43 35.7		-21 6.8		31 8.6		-18 28.4		19 23.5		-14 59.7		8 16.5		-10 54.5	
23 0	75 10.4	288.5	-23 0.3	-0.3	61 32.0	288.8	-22 40.3	0.8	48 25.1	289.4	-21 5.0	1.8	35 58.5	289.9	-18 25.8	2.6	24 14.0	290.5	-14 56.5	3.2	13 7.5	291.0	-10 50.9	3.6
20	79 58.8		-23 0.6		66 20.8		-22 39.5		53 14.4		-21 3.2		40 48.4		-18 23.2		29 4.5		-14 53.3		17 58.5		-10 47.3	
40	84 47.3		-23 0.8		71 9.6		-22 38.6		58 3.8		-21 1.3		45 38.4		-18 20.6		33 55.0		-14 50.1		22 49.4		-10 43.7	

2011 Moon

	10 Sep						11 Sep						12 Sep						13 Sep						14 Sep						15 Sep					
	GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec		
h m	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'
0 0	27	40.4	291.0	-10	40.1	3.6	17	5.1	291.3	-6	10.5	3.9	6	49.9	291.5	-1	29.9	3.9	356	44.3	291.6	3	11.0	3.9	346	38.4	291.5	7	42.3	3.6	336	22.6	291.3	11	54.4	3.3
20	32	31.4		-10	36.5		21	56.5		-6	6.6		11	41.4		-1	26.0		1	35.9		3	14.9		351	29.9		7	45.9		341	14.0		11	57.8	
40	37	22.4		-10	32.9		26	47.8		-6	2.8		16	32.9		-1	22.0		6	27.5		3	18.7		356	21.5		7	49.6		346	5.3		12	1.1	
1 0	42	13.4	291.0	-10	29.2	3.6	31	39.2	291.4	-5	58.9	3.8	21	24.5	291.6	-1	18.1	3.9	11	19.2	291.6	3	22.6	3.8	1	13.0	291.5	7	53.2	3.6	350	56.6	291.3	12	4.4	3.3
20	47	4.4		-10	25.6		36	30.5		-5	55.1		26	16.1		-1	14.2		16	10.8		3	26.4		6	4.5		7	56.9		355	48.0		12	7.7	
40	51	55.5		-10	22.0		41	21.9		-5	51.2		31	7.6		-1	10.3		21	2.4		3	30.3		10	56.1		8	0.5		0	39.3		12	11.0	
2 0	56	46.5	291.0	-10	18.3	3.6	46	13.2	291.4	-5	47.4	3.9	35	59.2	291.6	-1	6.3	3.9	25	54.0	291.6	3	34.1	3.8	15	47.6	291.5	8	4.1	3.6	5	30.6	291.3	12	14.3	3.3
20	61	37.5		-10	14.7		51	4.6		-5	43.5		40	50.7		-1	2.4		30	45.6		3	38.0		20	39.1		8	7.8		10	21.9		12	17.6	
40	66	28.5		-10	11.0		55	56.0		-5	39.6		45	42.3		-0	58.5		35	37.2		3	41.8		25	30.6		8	11.4		15	13.2		12	20.9	
3 0	71	19.6	291.1	-10	7.4	3.7	60	47.3	291.4	-5	35.8	3.9	50	33.8	291.6	-0	54.6	3.9	40	28.8	291.6	3	45.6	3.8	30	22.1	291.5	8	15.0	3.6	20	4.6	291.3	12	24.2	3.3
20	76	10.6		-10	3.7		65	38.7		-5	31.9		55	25.4		-0	50.7		45	20.4		3	49.5		35	13.7		8	18.6		24	55.9		12	27.4	
40	81	1.7		-10	0.1		70	30.1		-5	28.0		60	17.0		-0	46.7		50	12.0		3	53.3		40	5.2		8	22.3		29	47.2		12	30.7	
4 0	85	52.7	291.1	-9	56.4	3.7	75	21.5	291.4	-5	24.2	3.9	65	8.5	291.6	-0	42.8	3.9	55	3.6	291.6	3	57.1	3.8	44	56.7	291.5	8	25.9	3.6	34	38.5	291.3	12	34.0	3.2
20	90	43.8		-9	52.7		80	12.8		-5	20.3		70	0.1		-0	38.9		59	55.2		4	1.0		49	48.2		8	29.5		39	29.7		12	37.2	
40	95	34.8		-9	49.1		85	4.2		-5	16.4		74	51.7		-0	35.0		64	46.8		4	4.8		54	39.7		8	33.1		44	21.0		12	40.5	
5 0	100	25.9	291.1	-9	45.4	3.7	89	55.6	291.4	-5	12.6	3.9	79	43.2	291.6	-0	31.0	3.9	69	38.4	291.6	4	8.6	3.8	59	31.2	291.5	8	36.7	3.6	49	12.3	291.3	12	43.7	3.2
20	105	17.0		-9	41.7		94	47.0		-5	8.7		84	34.8		-0	27.1		74	30.1		4	12.5		64	22.7		8	40.3		54	3.6		12	47.0	
40	110	8.1		-9	38.0		99	38.4		-5	4.8		89	26.4		-0	23.2		79	21.7		4	16.3		69	14.2		8	43.9		58	54.9		12	50.2	
6 0	114	59.2	291.1	-9	34.3	3.7	104	29.8	291.4	-5	0.9	3.9	94	18.0	291.6	-0	19.3	3.9	84	13.3	291.6	4	20.1	3.8	74	5.7	291.5	8	47.5	3.6	63	46.2	291.3	12	53.4	3.2
20	119	50.3		-9	30.7		109	21.2		-4	57.0		99	9.5		-0	15.4		89	4.9		4	23.9		78	57.2		8	51.0		68	37.4		12	56.7	
40	124	41.4		-9	27.0		114	12.6		-4	53.2		104	1.1		-0	11.4		93	56.5		4	27.7		83	48.7		8	54.6		73	28.7		12	59.9	
7 0	129	32.5	291.1	-9	23.3	3.7	119	4.1	291.4	-4	49.3	3.9	108	52.7	291.6	-0	7.5	3.9	98	48.1	291.6	4	31.5	3.8	88	40.2	291.5	8	58.2	3.6	78	20.0	291.3	13	3.1	3.2
20	134	23.6		-9	19.6		123	55.5		-4	45.4		113	44.3		-0	3.6		103	39.7		4	35.4		93	31.7		9	1.8		83	11.2		13	6.3	
40	139	14.7		-9	15.9		128	46.9		-4	41.5		118	35.9		0	0.3		108	31.3		4	39.2		98	23.2		9	5.3		88	2.5		13	9.5	
8 0	144	5.8	291.1	-9	12.1	3.7	133	38.3	291.4	-4	37.6	3.9	123	27.4	291.6	0	4.2	3.9	113	22.9	291.6	4	43.0	3.8	103	14.7	291.5	9	8.9	3.6	92	53.7	291.2	13	12.7	3.2
20	148	56.9		-9	8.4		138	29.7		-4	33.7		128	19.0		0	8.1		118	14.5		4	46.8		108	6.2		9	12.5		97	45.0		13	15.9	
40	153	48.1		-9	4.7		143	21.2		-4	29.8		133	10.6		0	12.1		123	6.1		4	50.6		112	57.6		9	16.0		102	36.2		13	19.0	
9 0	158	39.2	291.1	-9	1.0	3.7	148	12.6	291.4	-4	26.0	3.9	138	2.2	291.6	0	16.0	3.9	127	57.7	291.6	4	54.4	3.8	117	49.1	291.5	9	19.6	3.5	107	27.5	291.2	13	22.2	3.2
20	163	30.3		-8	57.3		153	4.0		-4	22.1		142	53.8		0	19.9		132	49.3		4	58.2		122	40.6		9	23.1		112	18.7		13	25.4	
40	168	21.5		-8	53.6		157	55.5		-4	18.2		147	45.4		0	23.8		137	40.9		5	2.0		127	32.1		9	26.6		117	9.9		13	28.6	
10 0	173	12.6	291.2	-8	49.8	3.7	162	46.9	291.4	-4	14.3	3.9	152	37.0	291.6	0	27.7	3.9	142	32.5	291.6	5	5.7	3.8	132	23.5	291.5	9	30.2	3.5	122	1.2	291.2	13	31.7	3.1
20	178	3.8		-8	46.1		167	38.4		-4	10.4		157	28.5		0	31.6		147	24.1		5	9.5		137	15.0		9	33.7		126	52.4		13	34.9	
40	182	54.9		-8	42.4		172	29.8		-4	6.5		162	20.1		0	35.5		152	15.7		5	13.3		142	6.5		9	37.2		131	43.6		13	38.0	
11 0	187	46.1	291.2	-8	38.6	3.7	177	21.3	291.5	-4	2.6	3.9	167	11.7	291.6	0	39.4	3.9	157	7.2	291.6	5	17.1	3.8	146	57.9	291.5	9	40.8	3.5	136	34.8	291.2	13	41.1	3.1
20	192	37.3		-8	34.9		182	12.7		-3	58.7		172	3.3		0	43.3		161	58.8		5	20.9		151	49.4		9	44.3		141	26.0		13	44.3	
40	197	28.5		-8	31.1		187	4.2		-3	54.8		176	54.9		0	47.3		166	50.4		5	24.7		156	40.8		9	47.8		146	17.2		13	47.4	
12 0	202	19.6	291.2	-8	27.4	3.8	191	55.6	291.5	-3	50.9	3.9	181	46.5	291.6	0	51.2	3.9	171	42.0	291.6	5	28.4	3.8	161	32.3	291.4	9	51.3	3.5	151	8.4	291.2	13	50.5	3.1
20	207	10.8		-8	23.6		196	47.1		-3	47.0		186	38.1		0	55.1		176	33.6		5	32.2		166	23.7		9	54.8		155	59.6		13	53.6	
40	212	2.0		-8	19.9		201	38.5		-3	43.1		191	29.7		0	59.0		181	25.2		5	36.0		171	15.2		9	58.3		160	50.8		13	56.7	
13 0	216	53.2	291.2	-8	16.1	3.8	206	30.0	291.5	-3	39.2	3.9	196	21.3	291.6	1	2.9	3.9	186	16.8	291.6	5	39.7	3.8	176	6.6	291.4	10	1.8	3.5	165	42.0	291.2	13	59.8	3.1
20	221	44.4		-8	12.3		211	21.5		-3	35.2		201	12.9		1	6.8		191	8.4		5	43.5		180	58.1		10	5.3		170	33.2		14	2.9	
40	226	35.6		-8	8.6		216	13.0		-3	31.3		206	4.5		1	10.7		195	60.0		5	47.3		185	49.5		10	8.8		175	24.4		14	6.0	
14 0	231	26.8	291.2	-8	4.8	3.8	221	4.4	291.5	-3	27.4	3.9	210	56.1	291.6	1	14.6	3.9	200	51.5	291.6	5	51.0	3.8	190	41.0	291.4	10	12.3	3.5	180	15.6	291.2	14	9.1	3.1
20	236	18.0		-8	1.0		225	55.9		-3	23.5		215	47.7		1	18.5		205	43.1		5	54.8		195	32.4		10	15.8		185	6.7		14	12.2	
40	241	9.2		-7	57.3		230	47.4		-3	19.6		220	39.3		1	22.4		210	34.7		5	58.5		200	23.8		10	19.2		189	57.9		14	15.2	
15 0	246	0.5	291.2	-7	53.5	3.8	235	38.9	291.5	-3	15.7	3.9	225	30.9	291.6	1	26.3	3.9	215	26.3	291.6	6	2.3	3.7	205	15.3	291.4	10	22.7	3.5	194	49.1	291.2	14	18.3	3.0
20	250	51.7		-7	49.7		240	30.4		-3	11.8		230	22.5		1	30.2		220	17.9		6	6.0		210	6.7		10	26.2		199	40.2		14	21.3	
40	255	42.9		-7	45.9		245	21.9		-3	7.9		235	14.1		1	34.1		225	9.4		6	9.8		214	58.1		10	29.6		204	31.4		14	24.4	
16 0	260	34.2	291.2	-7	42.1	3.8	250	13.3	291.5	-3	4.0	3.9	240	5.7	291.6	1	38.0	3.9	230	1.0	291.6	6	13.5	3.7	219	49.5	291.4	10	33.1	3.4	209	22.5	291.1	14	27.4	3.0
20	265	25.4		-7	38.3		255	4.8		-3	0.0		244	57.3		1	41.9		234	52.6		6	17.2		224	40.9		10	36.5		214	13.7		14	30.5	
40	270	16.6		-7	34.6		259	56.3		-2	56.1		249	48.9		1	45.8		239	44.2		6	21.0		229	32.4		10	40.0		219	4.8		14	33.5	
17 0	275	7.9	291.3	-7	30.8	3.8	264	47.8	291.5	-2	52.2	3.9	254	40.5	291.6	1	49.6	3.9	244	35.7	291.6	6	24.7	3.7	234	23.8	291.4	10	43.4	3.4	223	56.0	291.1	14	36.5	3.0
20	279	59.1		-7	27.0		269	39.3		-2	48.3		259	32.1		1	53.5		249	27.3		6	28.4		239	15.2		10	46.8		228	47.1		14	39.5	
40	284	50.4		-7	23.2		274	30.8		-2	44.4		264	23.7		1	57.4		254	18.9		6	32.2		244	6.6		10	50.3		233	38.2		14	42.5	
18 0	289	41.7	291.3	-7	19.4	3.8	279	22.4	291.5	-2	40.5	3.9	269	15.4	291.6	2	1.3	3.9	259	10.4	291.6	6	35.9	3.7	248	58.0	291.4	10	53.7	3.4	238	29.4	291.1	14	45.5	3.0
20	294	32.9		-7	15.6		284	13.9		-2	36.5		274	7.0		2	5.2		264	2.0		6	39.6		253	49.4		10	57.1		243	20.5		14	48.5	
40	299	24.2		-7	11.7		289	5.4		-2	32.6		278	58.6		2	9.1		268	53.6		6	43.3		258	40.8		11	0.5		248	11.6		14	51.5	
19 0	304	15.5	291.3	-7	7.9	3.8	293	56.9	291.5	-2	28.7	3.9	283	50.2	291.6	2	13.0	3.9	273	45.1	291.6	6	47.0	3.7	263	32.2	291.4	11	3.9	3.4	253	2.7	291.1	14	54.5	3.0
20	309	6.8		-7	4.1		298	48.4		-2	24.8		288	41.8		2	16.8		278	36.7		6	50.7		268	23.5		11	7.3		257	53.8		14	57.5	
40	313	58.0		-7	0.3		303	39.9		-2	20.9		293	33.4		2	20.7		283	28.3		6	54.4		273	14.9		11	10.7		262	44.9		15	0.4	
20 0	318	49.3	291.3	-6	56.5	3.8	308	31.4	291.5	-2	16.9	3.9	298	25.0	291.6	2	24.6	3.9	288	19.8	291.6	6	58.1	3.7	278	6.3	291.4	11	14.1	3.4	267	36.0	291.1	15	3.4	2.9
20	323	40.6		-6	52.7		313	23.0		-2	13.0		303	16.6		2	28.5		293	11.4		7	1.8		282	57.7		11	17.5		272	27.1		15	6.4	
40	328	31.9		-6	48.8		318	14.5		-2	9.1		308	8.2		2	32.4		298	2.9		7	5.5		287	49.1		11	20.9		277	18.2		15	9.3	
21 0	333	23.2	291.3	-6	45.0	3.8	323	6.0	291.5	-2	5.2	3.9	312	59.8	291.6	2	36.2	3.9	302	54.5	291.6	7	9.2	3.7	292	40.4	291.4	11	24.3	3.4	282	9.3	291.1	15	12.2	2.9
20	338	14.5		-6	41.2		327	57.5		-2	1.3		317	51.4		2	40.1		307	46.0		7	12.9		297	31.8		11	27.7		287	0.4		15	15.2	
40	343	5.8		-6	37.4		332	49.1		-1	57.3		322	43.1		2	44.0		312	37.6		7	16.6		302	23.2		11	31.0		291	51.4		15	18.1	
22 0	347	57.2	291.3	-6	33.5	3.8	337	40.6	291.5	-1	53.4	3.9	327	34.7	291.6	2	47.8	3.9	317	29.1	291.5	7	20.3	3.7	307	14.5	291.4	11	34.4	3.3	296	42.5	291.1	15	21.0	2.9
20	352	48.5		-6	29.7		342	32.1		-1	49.5		332	26.3		2	51.7		322	20.7		7	23.9		312	5.9		11	37.7		301	33.6		15	23.9	
40	357	39.8		-6	25.9		347	23.7		-1	45.6		337	17.9		2	55.6		327	12.2		7	27.6		316	57.3		11	41.1		306	24.6		15	26.8	
23 0	2	31.1	291.3	-6	22.0	3.8	352	15.2	291.5	-1	41.6	3.9	342	9.5	291.6	2	59.4	3.9	332	3.8	291.5	7	31.3	3.7	321	48.6	291.3	11	44.4	3.3	311	15.7	291.0	15	29.7	2.9
20	7	22.4		-6	18.2		357	6.8		-1	37.7		347	1.1		3	3.3		336	55.3		7	34.9		326	40.0		11	47.8		316	6.7		15	32.6	
40	12	13.8		-6	14.3		1	58.3		-1	33.8		351	52.7		3	7.2		341	46.9		7	38.6		331	31.3		11	51.1		320	57.8		15	35.5	

2011 Moon

	16 Sep					17 Sep					18 Sep					19 Sep					20 Sep					21 Sep				
	GHA			Dec		GHA			Dec		GHA			Dec		GHA			Dec		GHA			Dec		GHA			Dec	
h m	°	′	d	°	′	d′	°	′	d	°	′	d′	°	′	d	°	′	d′	°	′	d	°	′	d′	°	′	d	°	′	d′
0 0	325	48.8	291.0	15	38.4		314	50.7		18	44.9		303	24.5		21	5.0		291	30.5		22	30.0		279	12.4		22	52.6		266	37.5		22	7.3	
20	330	39.9		15	41.2	2.9	319	41.3	290.7	18	47.2	2.3	308	14.8	290.3	21	6.6	1.6	296	20.4	289.9	22	30.8	0.8	284	2.0	289.6	22	52.4	-0.2	271	26.9	289.4	22	6.1	-1.1
40	335	30.9		15	44.1		324	32.0		18	49.5		313	5.1		21	8.1		301	10.3		22	31.5		288	51.6		22	52.3		276	16.4		22	5.0	
1 0	340	21.9	291.0	15	47.0		329	22.6		18	51.7		317	55.3		21	9.7		306	0.2		22	32.3		293	41.2		22	52.1		281	5.8		22	3.9	
20	345	13.0		15	49.8	2.8	334	13.3	290.6	18	54.0	2.3	322	45.6	290.2	21	11.2	1.5	310	50.1	289.9	22	33.0	0.7	298	30.8	289.6	22	51.9	-0.2	285	55.2	289.4	22	2.7	-1.2
40	350	4.0		15	52.6		339	3.9		18	56.2		327	35.8		21	12.8		315	39.9		22	33.7		303	20.4		22	51.7		290	44.7		22	1.5	
2 0	354	55.0	291.0	15	55.5		343	54.6		18	58.5		332	26.1		21	14.3		320	29.8		22	34.4		308	10.0		22	51.5		295	34.1		22	0.3	
20	359	46.0		15	58.3	2.8	348	45.2	290.6	19	0.7	2.2	337	16.3	290.2	21	15.8	1.5	325	19.7	289.9	22	35.1	0.7	312	59.6	289.6	22	51.2	-0.3	300	23.5	289.4	21	59.1	-1.2
40	4	37.0		16	1.1		353	35.8		19	2.9		342	6.5		21	17.3		330	9.6		22	35.7		317	49.2		22	51.0		305	12.9		21	57.9	
3 0	9	28.0	291.0	16	3.9		358	26.5		19	5.1		346	56.8		21	18.8		334	59.4		22	36.4		322	38.8		22	50.7		310	2.4		21	56.7	
20	14	19.0		16	6.7	2.8	3	17.1	290.6	19	7.3	2.2	351	47.0	290.2	21	20.3	1.5	339	49.3	289.9	22	37.1	0.6	327	28.4	289.6	22	50.4	-0.3	314	51.8	289.4	21	55.4	-1.3
40	19	10.0		16	9.5		8	7.7		19	9.5		356	37.2		21	21.7		344	39.1		22	37.7		332	18.0		22	50.2		319	41.2		21	54.2	
4 0	24	1.0	291.0	16	12.3		12	58.3		19	11.7		1	27.4		21	23.2		349	29.0		22	38.3		337	7.5		22	49.9		324	30.6		21	52.9	
20	28	51.9		16	15.1	2.8	17	48.9	290.6	19	13.9	2.2	6	17.6	290.2	21	24.7	1.4	354	18.8	289.8	22	38.9	0.6	341	57.1	289.6	22	49.5	-0.3	329	20.0	289.4	21	51.6	-1.3
40	33	42.9		16	17.9		22	39.5		19	16.1		11	7.8		21	26.1		359	8.7		22	39.5		346	46.7		22	49.2		334	9.5		21	50.3	
5 0	38	33.9	291.0	16	20.6		27	30.1		19	18.2		15	58.0		21	27.5		3	58.5		22	40.1		351	36.2		22	48.9		338	58.9		21	49.0	
20	43	24.9		16	23.4	2.8	32	20.7	290.6	19	20.4	2.1	20	48.2	290.2	21	28.9	1.4	8	48.3	289.8	22	40.7	0.6	356	25.8	289.6	22	48.5	-0.4	343	48.3	289.4	21	47.7	-1.3
40	48	15.8		16	26.1		37	11.2		19	22.5		25	38.4		21	30.3		13	38.2		22	41.2		1	15.4		22	48.1		348	37.7		21	46.3	
6 0	53	6.8	290.9	16	28.9		42	1.8		19	24.6		30	28.6		21	31.7		18	28.0		22	41.8		6	4.9		22	47.8		353	27.1		21	45.0	
20	57	57.7		16	31.6	2.7	46	52.4	290.6	19	26.7	2.1	35	18.7	290.2	21	33.1	1.4	23	17.8	289.8	22	42.3	0.5	10	54.5	289.6	22	47.4	-0.4	358	16.5	289.4	21	43.6	-1.4
40	62	48.7		16	34.3		51	42.9		19	28.9		40	8.9		21	34.5		28	7.6		22	42.8		15	44.0		22	47.0		3	5.9		21	42.2	
7 0	67	39.6	290.9	16	37.0		56	33.5		19	31.0		44	59.1		21	35.8		32	57.4		22	43.4		20	33.6		22	46.5		7	55.4		21	40.8	
20	72	30.5		16	39.8	2.7	61	24.0	290.5	19	33.0	2.1	49	49.2	290.2	21	37.2	1.4	37	47.2	289.8	22	43.9	0.5	25	23.1	289.5	22	46.1	-0.4	12	44.8	289.4	21	39.4	-1.4
40	77	21.5		16	42.5		66	14.6		19	35.1		54	39.4		21	38.5		42	37.0		22	44.3		30	12.7		22	45.7		17	34.2		21	38.0	
8 0	82	12.4	290.9	16	45.2		71	5.1		19	37.2		59	29.5		21	39.9		47	26.8		22	44.8		35	2.2		22	45.2		22	23.6		21	36.6	
20	87	3.3		16	47.8	2.7	75	55.7	290.5	19	39.3	2.1	64	19.6	290.1	21	41.2	1.3	52	16.6	289.8	22	45.3	0.5	39	51.8	289.5	22	44.7	-0.5	27	13.0	289.4	21	35.1	-1.5
40	91	54.2		16	50.5		80	46.2		19	41.3		69	9.8		21	42.5		57	6.4		22	45.7		44	41.3		22	44.2		32	2.4		21	33.7	
9 0	96	45.1	290.9	16	53.2		85	36.7		19	43.4		73	59.9		21	43.8		61	56.2		22	46.2		49	30.8		22	43.7		36	51.8		21	32.2	
20	101	36.0		16	55.9	2.7	90	27.2	290.5	19	45.4	2.0	78	50.0	290.1	21	45.0	1.3	66	46.0	289.8	22	46.6	0.4	54	20.4	289.5	22	43.2	-0.5	41	41.2	289.4	21	30.7	-1.5
40	106	26.9		16	58.5		95	17.8		19	47.4		83	40.2		21	46.3		71	35.7		22	47.0		59	9.9		22	42.7		46	30.6		21	29.2	
10 0	111	17.8	290.9	17	1.2		100	8.3		19	49.4		88	30.3		21	47.6		76	25.5		22	47.4		63	59.4		22	42.2		51	20.0		21	27.7	
20	116	8.7		17	3.8	2.6	104	58.8	290.5	19	51.4	2.0	93	20.4	290.1	21	48.8	1.2	81	15.3	289.8	22	47.8	0.4	68	48.9	289.5	22	41.6	-0.6	56	9.4	289.4	21	26.1	-1.6
40	120	59.6		17	6.4		109	49.3		19	53.4		98	10.5		21	50.1		86	5.1		22	48.2		73	38.5		22	41.0		60	58.8		21	24.6	
11 0	125	50.5	290.9	17	9.1		114	39.7		19	55.4		103	0.6		21	51.3		90	54.8		22	48.5		78	28.0		22	40.5		65	48.2		21	23.0	
20	130	41.4		17	11.7	2.6	119	30.2	290.5	19	57.4	2.0	107	50.7	290.1	21	52.5	1.2	95	44.6	289.8	22	48.9	0.3	83	17.5	289.5	22	39.9	-0.6	70	37.6	289.4	21	21.5	-1.6
40	135	32.2		17	14.3		124	20.7		19	59.3		112	40.8		21	53.7		100	34.3		22	49.2		88	7.0		22	39.3		75	27.0		21	19.9	
12 0	140	23.1	290.9	17	16.9		129	11.2		20	1.3		117	30.8		21	54.9		105	24.1		22	49.5		92	56.5		22	38.6		80	16.4		21	18.3	
20	145	13.9		17	19.5	2.6	134	1.7	290.5	20	3.2	1.9	122	20.9	290.1	21	56.1	1.2	110	13.8	289.7	22	49.8	0.3	97	46.0	289.5	22	38.0	-0.6	85	5.8	289.4	21	16.7	-1.6
40	150	4.8		17	22.1		138	52.1		20	5.2		127	11.0		21	57.2		115	3.5		22	50.1		102	35.5		22	37.4		89	55.2		21	15.0	
13 0	154	55.6	290.8	17	24.6		143	42.6		20	7.1		132	1.1		21	58.4		119	53.3		22	50.4		107	25.0		22	36.7		94	44.6		21	13.4	
20	159	46.5		17	27.2	2.6	148	33.0	290.4	20	9.0	1.9	136	51.1	290.1	21	59.5	1.1	124	43.0	289.7	22	50.7	0.3	112	14.5	289.5	22	36.0	-0.7	99	34.0	289.4	21	11.8	-1.7
40	164	37.3		17	29.8		153	23.5		20	10.9		141	41.2		22	0.7		129	32.7		22	50.9		117	4.0		22	35.3		104	23.3		21	10.1	
14 0	169	28.2	290.8	17	32.3		158	13.9		20	12.8		146	31.2		22	1.8		134	22.5		22	51.2		121	53.5		22	34.6		109	12.7		21	8.4	
20	174	19.0		17	34.9	2.5	163	4.3	290.4	20	14.7	1.9	151	21.3	290.0	22	2.9	1.1	139	12.2	289.7	22	51.4	0.2	126	43.0	289.5	22	33.9	-0.7	114	2.1	289.4	21	6.7	-1.7
40	179	9.8		17	37.4		167	54.8		20	16.6		156	11.3		22	4.0		144	1.9		22	51.6		131	32.5		22	33.2		118	51.5		21	5.0	
15 0	184	0.6	290.8	17	39.9		172	45.2		20	18.5		161	1.4		22	5.1		148	51.6		22	51.9		136	22.0		22	32.4		123	40.9		21	3.3	
20	188	51.4		17	42.4	2.5	177	35.6	290.4	20	20.3	1.8	165	51.4	290.0	22	6.2	1.1	153	41.3	289.7	22	52.1	0.2	141	11.5	289.5	22	31.7	-0.8	128	30.3	289.4	21	1.6	-1.7
40	193	42.2		17	44.9		182	26.0		20	22.2		170	41.4		22	7.2		158	31.0		22	52.2		146	1.0		22	30.9		133	19.7		20	59.8	
16 0	198	33.0	290.8	17	47.4		187	16.4		20	24.0		175	31.4		22	8.3		163	20.7		22	52.4		150	50.5		22	30.1		138	9.1		20	58.1	
20	203	23.8		17	49.9	2.5	192	6.8	290.4	20	25.8	1.8	180	21.5	290.0	22	9.3	1.0	168	10.4	289.7	22	52.6	0.1	155	40.0	289.5	22	29.3	-0.8	142	58.5	289.4	20	56.3	-1.8
40	208	14.6		17	52.4		196	57.2		20	27.6		185	11.5		22	10.4		173	0.1		22	52.7		160	29.4		22	28.5		147	47.8		20	54.5	
17 0	213	5.4	290.8	17	54.9		201	47.6		20	29.4		190	1.5		22	11.4		177	49.8		22	52.8		165	18.9		22	27.7		152	37.2		20	52.7	
20	217	56.2		17	57.4	2.5	206	38.0	290.4	20	31.2	1.8	194	51.5	290.0	22	12.4	1.0	182	39.5	289.7	22	53.0	0.1	170	8.4	289.5	22	26.9	-0.9	157	26.6	289.4	20	50.9	-1.8
40	222	47.0		17	59.8		211	28.4		20	33.0		199	41.5		22	13.4		187	29.2		22	53.1		174	57.9		22	26.0		162	16.0		20	49.1	
18 0	227	37.7	290.8	18	2.3		216	18.8		20	34.8		204	31.5		22	14.4		192	18.8		22	53.1		179	47.3		22	25.1		167	5.4		20	47.2	
20	232	28.5		18	4.7	2.4	221	9.1	290.4	20	36.6	1.8	209	21.5	290.0	22	15.3	0.9	197	8.5	289.7	22	53.2	0.1	184	36.8	289.5	22	24.3	-0.9	171	54.8	289.4	20	45.4	-1.9
40	237	19.3		18	7.1		225	59.5		20	38.3		214	11.4		22	16.3		201	58.2		22	53.3		189	26.3		22	23.4		176	44.1		20	43.5	
19 0	242	10.0	290.7	18	9.6		230	49.8		20	40.1		219	1.4		22	17.2		206	47.8		22	53.3		194	15.7		22	22.5		181	33.5		20	41.6	
20	247	0.8		18	12.0	2.4	235	40.2	290.3	20	41.8	1.7	223	51.4	290.0	22	18.2	0.9	211	37.5	289.7	22	53.4	0.0	199	5.2	289.5	22	21.5	-0.9	186	22.9	289.4	20	39.7	-1.9
40	251	51.5		18	14.4		240	30.5		20	43.5		228	41.4		22	19.1		216	27.2		22	53.4		203	54.7		22	20.6		191	12.3		20	37.8	
20 0	256	42.2	290.7	18	16.8		245	20.9		20	45.2		233	31.3		22	20.0		221	16.8		22	53.4		208	44.1		22	19.7		196	1.7		20	35.9	
20	261	33.0		18	19.2	2.4	250	11.2	290.3	20	46.9	1.7	238	21.3	290.0	22	20.9	0.9	226	6.5	289.6	22	53.4	0.0	213	33.6	289.5	22	18.7	-1.0	200	51.1	289.4	20	33.9	-2.0
40	266	23.7		18	21.6		255	1.5		20	48.6		243	11.2		22	21.8		230	56.1		22	53.4		218	23.0		22	17.7		205	40.4		20	32.0	
21 0	271	14.4	290.7	18	23.9		259	51.9		20	50.3		248	1.2		22	22.7		235	45.8		22	53.4		223	12.5		22	16.8		210	29.8		20	30.0	
20	276	5.1		18	26.3	2.4	264	42.2	290.3	20	52.0	1.7	252	51.1	289.9	22	23.6	0.8	240	35.4	289.6	22	53.4	-0.1	228	1.9	289.4	22	15.8	-1.0	215	19.2	289.4	20	28.1	-2.0
40	280	55.8		18	28.7		269	32.5		20	53.6		257	41.1		22	24.4		245	25.0		22	53.3		232	51.4		22	14.7		220	8.6		20	26.1	
22 0	285	46.5	290.7	18	31.0		274	22.8		20	55.3		262	31.0		22	25.2		250	14.7		22	53.2		237	40.8		22	13.7		224	58.0		20	24.1	
20	290	37.2		18	33.3	2.3	279	13.1	290.3	20	56.9	1.6	267	20.9	289.9	22	26.1	0.8	255	4.3	289.6	22	53.2	-0.1	242	30.3	289.4	22	12.7	-1.1	229	47.3	289.4	20	22.1	-2.0
40	295	27.9		18	35.7		284	3.4		20	58.6		272	10.8		22	26.9		259	53.9		22	53.1		247	19.7		22	11.6		234	36.7		20	20.0	
23 0	300	18.6	290.7	18	38.0		288	53.7		21	0.2		277	0.8		22	27.7		264	43.6		22	53.0		252	9.2		22	10.5		239	26.1		20	18.0	
20	305	9.3		18	40.3	2.3	293	44.0	290.3	21	1.8	1.6	281	50.7	289.9	22	28.5	0.8	269	33.2	289.6	22	52.9	-0.1	256	58.6	289.4	22	9.5	-1.1	244	15.5	289.4	20	15.9	-2.1
40	309	60.0		18	42.6		298	34.3		21	3.4		286	40.6		22	29.3		274	22.8		22	52.7		261	48.0		22	8.4		249	4.8		20	13.9	

2011 Moon

	22 Sep						23 Sep						24 Sep						25 Sep						26 Sep						27 Sep					
	GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec		
h m	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'
0 0	253	54.2	289.4	20	11.8	-2.1	241	10.0	289.4	17	7.8	-3.0	228	28.5	289.4	13	1.4	-3.8	215	49.3	289.4	8	3.6	-4.5	203	7.1	289.4	2	29.8	-4.8	190	13.9	289.1	-3	19.6	-4.8
20	258	43.6		20	9.7		245	59.4		17	4.8		233	18.0		12	57.6		220	38.7		7	59.1		207	56.4		2	25.0		195	3.1		-3	24.4	
40	263	33.0		20	7.6		250	48.8		17	1.8		238	7.4		12	53.8		225	28.2		7	54.7		212	45.8		2	20.2		199	52.2		-3	29.3	
1 0	268	22.4	289.4	20	5.5	-2.2	255	38.2	289.4	16	58.7	-3.1	242	56.9	289.4	12	50.0	-3.9	230	17.6	289.4	7	50.2	-4.4	217	35.1	289.3	2	15.4	-4.8	204	41.3	289.1	-3	34.1	-4.9
20	273	11.7		20	3.3		260	27.6		16	55.7		247	46.3		12	46.1		235	7.1		7	45.8		222	24.5		2	10.6		209	30.5		-3	39.0	
40	278	1.1		20	1.2		265	17.0		16	52.6		252	35.8		12	42.3		239	56.5		7	41.3		227	13.8		2	5.8		214	19.6		-3	43.8	
2 0	282	50.5	289.4	19	59.0	-2.2	270	6.4	289.4	16	49.5	-3.1	257	25.2	289.5	12	38.4	-3.9	244	45.9	289.4	7	36.9	-4.5	232	3.2	289.3	2	1.0	-4.8	219	8.7	289.1	-3	48.7	-4.8
20	287	39.9		19	56.8		274	55.8		16	46.5		262	14.7		12	34.5		249	35.4		7	32.4		236	52.5		1	56.2		223	57.9		-3	53.5	
40	292	29.2		19	54.6		279	45.2		16	43.4		267	4.1		12	30.6		254	24.8		7	27.9		241	41.9		1	51.3		228	47.0		-3	58.4	
3 0	297	18.6	289.4	19	52.4	-2.2	284	34.6	289.4	16	40.2	-3.1	271	53.6	289.5	12	26.8	-3.9	259	14.3	289.4	7	23.4	-4.5	246	31.2	289.3	1	46.5	-4.8	233	36.1	289.1	-4	3.2	-4.8
20	302	8.0		19	50.2		289	24.0		16	37.1		276	43.0		12	22.9		264	3.7		7	18.9		251	20.5		1	41.7		238	25.2		-4	8.0	
40	306	57.4		19	48.0		294	13.4		16	34.0		281	32.5		12	18.9		268	53.2		7	14.4		256	9.9		1	36.9		243	14.3		-4	12.9	
4 0	311	46.8	289.4	19	45.8	-2.3	299	2.8	289.4	16	30.8	-3.2	286	21.9	289.5	12	15.0	-3.9	273	42.6	289.4	7	9.9	-4.5	260	59.2	289.3	1	32.0	-4.8	248	3.4	289.1	-4	17.7	-4.8
20	316	36.1		19	43.5		303	52.2		16	27.7		291	11.4		12	11.1		278	32.1		7	5.4		265	48.5		1	27.2		252	52.5		-4	22.5	
40	321	25.5		19	41.2		308	41.6		16	24.5		296	0.8		12	7.1		283	21.5		7	0.9		270	37.9		1	22.4		257	41.6		-4	27.3	
5 0	326	14.9	289.4	19	39.0	-2.3	313	31.0	289.4	16	21.3	-3.2	300	50.3	289.5	12	3.2	-4.0	288	10.9	289.4	6	56.4	-4.5	275	27.2	289.3	1	17.5	-4.8	262	30.7	289.1	-4	32.2	-4.8
20	331	4.3		19	36.7		318	20.5		16	18.1		305	39.7		11	59.2		293	0.4		6	51.8		280	16.5		1	12.7		267	19.7		-4	37.0	
40	335	53.6		19	34.4		323	9.9		16	14.9		310	29.2		11	55.3		297	49.8		6	47.3		285	5.8		1	7.9		272	8.8		-4	41.8	
6 0	340	43.0	289.4	19	32.0	-2.3	327	59.3	289.4	16	11.7	-3.2	315	18.6	289.5	11	51.3	-4.0	302	39.3	289.4	6	42.8	-4.6	289	55.1	289.3	1	3.0	-4.8	276	57.9	289.1	-4	46.6	-4.8
20	345	32.4		19	29.7		332	48.7		16	8.5		320	8.1		11	47.3		307	28.7		6	38.2		294	44.5		0	58.2		281	47.0		-4	51.4	
40	350	21.8		19	27.4		337	38.1		16	5.3		324	57.6		11	43.3		312	18.1		6	33.7		299	33.8		0	53.3		286	36.0		-4	56.2	
7 0	355	11.2	289.4	19	25.0	-2.4	342	27.5	289.4	16	2.0	-3.3	329	47.0	289.5	11	39.3	-4.0	317	7.6	289.4	6	29.1	-4.6	304	23.1	289.3	0	48.5	-4.8	291	25.1	289.1	-5	1.1	-4.8
20	0	0.5		19	22.6		347	16.9		15	58.7		334	36.5		11	35.3		321	57.0		6	24.5		309	12.4		0	43.7		296	14.2		-5	5.9	
40	4	49.9		19	20.3		352	6.4		15	55.5		339	25.9		11	31.2		326	46.4		6	20.0		314	1.7		0	38.8		301	3.2		-5	10.7	
8 0	9	39.3	289.4	19	17.9	-2.4	356	55.8	289.4	15	52.2	-3.3	344	15.4	289.5	11	27.2	-4.1	331	35.9	289.4	6	15.4	-4.6	318	51.0	289.3	0	34.0	-4.9	305	52.3	289.0	-5	15.5	-4.8
20	14	28.7		19	15.4		1	45.2		15	48.9		349	4.8		11	23.2		336	25.3		6	10.8		323	40.3		0	29.1		310	41.3		-5	20.3	
40	19	18.1		19	13.0		6	34.6		15	45.6		353	54.3		11	19.1		341	14.7		6	6.2		328	29.6		0	24.2		315	30.3		-5	25.0	
9 0	24	7.4	289.4	19	10.6	-2.5	11	24.0	289.4	15	42.3	-3.4	358	43.7	289.5	11	15.0	-4.1	346	4.2	289.4	6	1.6	-4.6	333	18.9	289.3	0	19.4	-4.9	320	19.4	289.0	-5	29.8	-4.8
20	28	56.8		19	8.1		16	13.4		15	38.9		3	33.2		11	11.0		350	53.6		5	57.0		338	8.2		0	14.5		325	8.4		-5	34.6	
40	33	46.2		19	5.7		21	2.9		15	35.6		8	22.7		11	6.9		355	43.0		5	52.4		342	57.5		0	9.7		329	57.4		-5	39.4	
10 0	38	35.6	289.4	19	3.2	-2.5	25	52.3	289.4	15	32.2	-3.4	13	12.1	289.5	11	2.8	-4.1	0	32.4	289.4	5	47.8	-4.6	347	46.8	289.3	0	4.8	-4.9	334	46.5	289.0	-5	44.2	-4.8
20	43	25.0		19	0.7		30	41.7		15	28.9		18	1.6		10	58.7		5	21.9		5	43.2		352	36.0		0	0.0		339	35.5		-5	49.0	
40	48	14.3		18	58.2		35	31.1		15	25.5		22	51.0		10	54.6		10	11.3		5	38.5		357	25.3		-0	4.9		344	24.5		-5	53.7	
11 0	53	3.7	289.4	18	55.7	-2.5	40	20.6	289.4	15	22.1	-3.4	27	40.5	289.5	10	50.5	-4.1	15	0.7	289.4	5	33.9	-4.6	2	14.6	289.3	-0	9.8	-4.9	349	13.5	289.0	-5	58.5	-4.8
20	57	53.1		18	53.2		45	10.0		15	18.7		32	29.9		10	46.4		19	50.1		5	29.3		7	3.9		-0	14.6		354	2.5		-6	3.3	
40	62	42.5		18	50.6		49	59.4		15	15.3		37	19.4		10	42.2		24	39.6		5	24.6		11	53.1		-0	19.5		358	51.5		-6	8.0	
12 0	67	31.9	289.4	18	48.1	-2.6	54	48.8	289.4	15	11.9	-3.5	42	8.9	289.5	10	38.1	-4.2	29	29.0	289.4	5	20.0	-4.7	16	42.4	289.3	-0	24.4	-4.9	3	40.5	289.0	-6	12.8	-4.7
20	72	21.3		18	45.5		59	38.2		15	8.4		46	58.3		10	33.9		34	18.4		5	15.3		21	31.7		-0	29.2		8	29.5		-6	17.5	
40	77	10.6		18	42.9		64	27.7		15	5.0		51	47.8		10	29.8		39	7.8		5	10.7		26	20.9		-0	34.1		13	18.5		-6	22.3	
13 0	82	0.0	289.4	18	40.3	-2.6	69	17.1	289.4	15	1.5	-3.5	56	37.2	289.5	10	25.6	-4.2	43	57.2	289.4	5	6.0	-4.7	31	10.2	289.3	-0	39.0	-4.9	18	7.5	289.0	-6	27.0	-4.7
20	86	49.4		18	37.7		74	6.5		14	58.1		61	26.7		10	21.4		48	46.6		5	1.4		35	59.5		-0	43.8		22	56.5		-6	31.7	
40	91	38.8		18	35.1		78	56.0		14	54.6		66	16.1		10	17.2		53	36.0		4	56.7		40	48.7		-0	48.7		27	45.4		-6	36.5	
14 0	96	28.2	289.4	18	32.5	-2.7	83	45.4	289.4	14	51.1	-3.5	71	5.6	289.5	10	13.0	-4.2	58	25.5	289.4	4	52.0	-4.7	45	38.0	289.2	-0	53.6	-4.9	32	34.4	289.0	-6	41.2	-4.7
20	101	17.6		18	29.9		88	34.8		14	47.6		75	55.1		10	8.8		63	14.9		4	47.3		50	27.2		-0	58.4		37	23.4		-6	45.9	
40	106	6.9		18	27.2		93	24.2		14	44.1		80	44.5		10	4.6		68	4.3		4	42.7		55	16.5		-1	3.3		42	12.3		-6	50.7	
15 0	110	56.3	289.4	18	24.5	-2.7	98	13.7	289.4	14	40.6	-3.6	85	34.0	289.5	10	0.4	-4.2	72	53.7	289.4	4	38.0	-4.7	60	5.7	289.2	-1	8.2	-4.9	47	1.3	288.9	-6	55.4	-4.7
20	115	45.7		18	21.9		103	3.1		14	37.0		90	23.4		9	56.2		77	43.1		4	33.3		64	54.9		-1	13.1		51	50.2		-7	0.1	
40	120	35.1		18	19.2		107	52.5		14	33.5		95	12.9		9	52.0		82	32.5		4	28.6		69	44.2		-1	17.9		56	39.2		-7	4.8	
16 0	125	24.5	289.4	18	16.5	-2.7	112	42.0	289.4	14	29.9	-3.6	100	2.3	289.5	9	47.7	-4.3	87	21.9	289.4	4	23.9	-4.7	74	33.4	289.2	-1	22.8	-4.9	61	28.1	288.9	-7	9.5	-4.7
20	130	13.9		18	13.7		117	31.4		14	26.4		104	51.8		9	43.5		92	11.3		4	19.2		79	22.6		-1	27.7		66	17.0		-7	14.2	
40	135	3.3		18	11.0		122	20.8		14	22.8		109	41.3		9	39.2		97	0.7		4	14.5		84	11.9		-1	32.5		71	6.0		-7	18.9	
17 0	139	52.7	289.4	18	8.3	-2.8	127	10.3	289.4	14	19.2	-3.6	114	30.7	289.5	9	34.9	-4.3	101	50.1	289.4	4	9.7	-4.7	89	1.1	289.2	-1	37.4	-4.9	75	54.9	288.9	-7	23.6	-4.7
20	144	42.1		18	5.5		131	59.7		14	15.6		119	20.2		9	30.7		106	39.5		4	5.0		93	50.3		-1	42.3		80	43.8		-7	28.2	
40	149	31.4		18	2.7		136	49.1		14	12.0		124	9.6		9	26.4		111	28.9		4	0.3		98	39.5		-1	47.2		85	32.7		-7	32.9	
18 0	154	20.8	289.4	18	0.0	-2.8	141	38.6	289.4	14	8.4	-3.6	128	59.1	289.5	9	22.1	-4.3	116	18.3	289.4	3	55.6	-4.8	103	28.7	289.2	-1	52.0	-4.9	90	21.7	288.9	-7	37.6	-4.7
20	159	10.2		17	57.2		146	28.0		14	4.7		133	48.5		9	17.8		121	7.7		3	50.8		108	17.9		-1	56.9		95	10.6		-7	42.3	
40	163	59.6		17	54.4		151	17.5		14	1.1		138	38.0		9	13.5		125	57.1		3	46.1		113	7.1		-2	1.8		99	59.5		-7	46.9	
19 0	168	49.0	289.4	17	51.6	-2.9	156	6.9	289.4	13	57.5	-3.7	143	27.5	289.5	9	9.2	-4.3	130	46.5	289.4	3	41.3	-4.7	117	56.3	289.2	-2	6.6	-4.9	104	48.4	288.9	-7	51.6	-4.6
20	173	38.4		17	48.7		160	56.3		13	53.8		148	16.9		9	4.8		135	35.8		3	36.6		122	45.5		-2	11.5		109	37.3		-7	56.2	
40	178	27.8		17	45.9		165	45.8		13	50.1		153	6.4		9	0.5		140	25.2		3	31.9		127	34.7		-2	16.4		114	26.1		-8	0.9	
20 0	183	17.2	289.4	17	43.0	-2.9	170	35.2	289.4	13	46.4	-3.7	157	55.8	289.5	8	56.2	-4.4	145	14.6	289.4	3	27.1	-4.8	132	23.9	289.2	-2	21.2	-4.9	119	15.0	288.9	-8	5.5	-4.6
20	188	6.6		17	40.2		175	24.7		13	42.7		162	45.3		8	51.8		150	4.0		3	22.3		137	13.1		-2	26.1		124	3.9		-8	10.1	
40	192	56.0		17	37.3		180	14.1		13	39.0		167	34.7		8	47.5		154	53.4		3	17.6		142	2.3		-2	31.0		128	52.8		-8	14.8	
21 0	197	45.4	289.4	17	34.4	-2.9	185	3.5	289.4	13	35.3	-3.7	172	24.2	289.5	8	43.1	-4.4	159	42.7	289.4	3	12.8	-4.8	146	51.5	289.2	-2	35.8	-4.9	133	41.6	288.9	-8	19.4	-4.6
20	202	34.8		17	31.5		189	53.0		13	31.6		177	13.6		8	38.8		164	32.1		3	8.1		151	40.6		-2	40.7		138	30.5		-8	24.0	
40	207	24.2		17	28.6		194	42.4		13	27.9		182	3.1		8	34.4		169	21.5		3	3.3		156	29.8		-2	45.6		143	19.4		-8	28.6	
22 0	212	13.6	289.4	17	25.6	-2.9	199	31.9	289.4	13	24.1	-3.8	186	52.5	289.5	8	30.0	-4.4	174	10.9	289.4	2	58.5	-4.8	161	19.0	289.2	-2	50.4	-4.9	148	8.2	288.8	-8	33.2	-4.6
20	217	3.0		17	22.7		204	21.3		13	20.4		191	42.0		8	25.6		179	0.2		2	53.7		166	8.2		-2	55.3		152	57.1		-8	37.8	
40	221	52.4		17	19.7		209	10.8		13	16.6		196	31.4		8	21.2		183	49.6		2	49.0		170	57.3		-3	0.2		157	45.9		-8	42.4	
23 0	226	41.8	289.4	17	16.8	-3.0	214	0.2	289.4	13	12.8	-3.8	201	20.9	289.5	8	16.8	-4.4	188	39.0	289.4	2	44.2	-4.8	175	46.5	289.1	-3	5.0	-4.9	162	34.7	288.8	-8	47.0	-4.6
20	231	31.2		17	13.8		218	49.6		13	9.0		206	10.4		8	12.4		193	28.3		2	39.4		180	35.6		-3	9.9		167	23.6		-8	51.6	
40	236	20.6		17	10.8		223	39.1		13	5.3		210	59.8		8	8.0		198	17.7		2	34.6		185	24.8		-3	14.7		172	12.4		-8	56.1	

2011 Moon

	28 Sep						29 Sep						30 Sep						1 Oct						2 Oct						3 Oct					
	GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec		
h m	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'
0 0	177	1.2	288.8	-9	0.7	-4.6	163	22.7	288.4	-14	8.1	-3.9	149	18.0	288.1	-18	17.9	-2.9	134	55.2	288.0	-21	11.1	-1.8	120	30.7	288.1	-22	37.4	-0.6	106	25.1	288.5	-22	36.1	0.6
20	181	50.0		-9	5.3		168	11.1		-14	12.1		154	6.1		-18	20.9		139	43.1		-21	12.9		125	18.8		-22	38.0		111	13.6		-22	35.5	
40	186	38.9		-9	9.8		172	59.6		-14	16.0		158	54.2		-18	23.8		144	31.1		-21	14.7		130	6.9		-22	38.5		116	2.0		-22	34.8	
1 0	191	27.7	288.8	-9	14.4	-4.5	177	48.0	288.4	-14	19.9	-3.9	163	42.3	288.1	-18	26.7	-2.9	149	19.0	288.0	-21	16.5	-1.7	134	55.0	288.1	-22	39.1	-0.5	120	50.5	288.5	-22	34.2	0.7
20	196	16.5		-9	18.9		182	36.4		-14	23.7		168	30.4		-18	29.7		154	7.0		-21	18.3		139	43.1		-22	39.6		125	39.0		-22	33.6	
40	201	5.3		-9	23.4		187	24.8		-14	27.6		173	18.5		-18	32.6		158	55.0		-21	20.0		144	31.2		-22	40.1		130	27.5		-22	32.9	
2 0	205	54.1	288.8	-9	28.0	-4.5	192	13.3	288.4	-14	31.5	-3.8	178	6.6	288.1	-18	35.5	-2.8	163	42.9	288.0	-21	21.7	-1.7	149	19.3	288.1	-22	40.6	-0.5	135	16.0	288.5	-22	32.2	0.7
20	210	42.8		-9	32.5		197	1.7		-14	35.3		182	54.7		-18	38.3		168	30.9		-21	23.4		154	7.4		-22	41.1		140	4.6		-22	31.5	
40	215	31.6		-9	37.0		201	50.1		-14	39.1		187	42.8		-18	41.2		173	18.8		-21	25.1		158	55.5		-22	41.5		144	53.1		-22	30.8	
3 0	220	20.4	288.8	-9	41.5	-4.5	206	38.5	288.4	-14	43.0	-3.8	192	30.8	288.1	-18	44.0	-2.8	178	6.8	288.0	-21	26.8	-1.6	163	43.6	288.1	-22	42.0	-0.4	149	41.6	288.6	-22	30.1	0.8
20	225	9.2		-9	46.0		211	26.9		-14	46.8		197	18.9		-18	46.9		182	54.8		-21	28.4		168	31.7		-22	42.4		154	30.2		-22	29.3	
40	229	57.9		-9	50.5		216	15.2		-14	50.6		202	7.0		-18	49.7		187	42.7		-21	30.1		173	19.8		-22	42.8		159	18.7		-22	28.6	
4 0	234	46.7	288.8	-9	55.0	-4.5	221	3.6	288.4	-14	54.4	-3.8	206	55.1	288.1	-18	52.5	-2.8	192	30.7	288.0	-21	31.7	-1.6	178	7.9	288.1	-22	43.2	-0.3	164	7.3	288.6	-22	27.8	0.8
20	239	35.5		-9	59.5		225	52.0		-14	58.1		211	43.1		-18	55.3		197	18.6		-21	33.3		182	56.1		-22	43.5		168	55.9		-22	27.0	
40	244	24.2		-10	3.9		230	40.4		-15	1.9		216	31.2		-18	58.0		202	6.6		-21	34.9		187	44.2		-22	43.9		173	44.4		-22	26.2	
5 0	249	13.0	288.7	-10	8.4	-4.4	235	28.7	288.4	-15	5.7	-3.7	221	19.3	288.1	-19	0.8	-2.7	206	54.5	288.0	-21	36.4	-1.5	192	32.3	288.1	-22	44.2	-0.3	178	33.0	288.6	-22	25.4	0.9
20	254	1.7		-10	12.8		240	17.1		-15	9.4		226	7.3		-19	3.5		211	42.5		-21	38.0		197	20.5		-22	44.5		183	21.6		-22	24.5	
40	258	50.4		-10	17.3		245	5.5		-15	13.1		230	55.4		-19	6.2		216	30.5		-21	39.5		202	8.6		-22	44.8		188	10.2		-22	23.7	
6 0	263	39.2	288.7	-10	21.7	-4.4	249	53.8	288.3	-15	16.8	-3.7	235	43.4	288.0	-19	8.9	-2.7	221	18.4	288.0	-21	41.0	-1.5	206	56.8	288.2	-22	45.1	-0.3	192	58.8	288.6	-22	22.8	0.9
20	268	27.9		-10	26.2		254	42.2		-15	20.5		240	31.5		-19	11.6		226	6.4		-21	42.5		211	44.9		-22	45.4		197	47.4		-22	21.9	
40	273	16.6		-10	30.6		259	30.5		-15	24.2		245	19.5		-19	14.3		230	54.4		-21	44.0		216	33.1		-22	45.6		202	36.0		-22	21.0	
7 0	278	5.3	288.7	-10	35.0	-4.4	264	18.8	288.3	-15	27.9	-3.7	250	7.6	288.0	-19	17.0	-2.6	235	42.3	288.0	-21	45.5	-1.4	221	21.2	288.2	-22	45.9	-0.2	207	24.7	288.6	-22	20.1	0.9
20	282	54.0		-10	39.4		269	7.2		-15	31.6		254	55.6		-19	19.6		240	30.3		-21	46.9		226	9.4		-22	46.1		212	13.3		-22	19.2	
40	287	42.7		-10	43.8		273	55.5		-15	35.2		259	43.7		-19	22.2		245	18.3		-21	48.4		230	57.6		-22	46.3		217	2.0		-22	18.3	
8 0	292	31.4	288.7	-10	48.2	-4.4	278	43.8	288.3	-15	38.9	-3.6	264	31.7	288.0	-19	24.8	-2.6	250	6.2	288.0	-21	49.8	-1.4	235	45.8	288.2	-22	46.5	-0.1	221	50.6	288.7	-22	17.3	1.0
20	297	20.1		-10	52.6		283	32.1		-15	42.5		269	19.7		-19	27.4		254	54.2		-21	51.2		240	34.0		-22	46.6		226	39.3		-22	16.3	
40	302	8.8		-10	56.9		288	20.5		-15	46.1		274	7.8		-19	30.0		259	42.1		-21	52.6		245	22.1		-22	46.8		231	27.9		-22	15.4	
9 0	306	57.5	288.7	-11	1.3	-4.4	293	8.8	288.3	-15	49.7	-3.6	278	55.8	288.0	-19	32.6	-2.5	264	30.1	288.0	-21	53.9	-1.3	250	10.3	288.2	-22	46.9	-0.1	236	16.6	288.7	-22	14.4	1.0
20	311	46.2		-11	5.7		297	57.1		-15	53.3		283	43.8		-19	35.1		269	18.1		-21	55.3		254	58.5		-22	47.0		241	5.3		-22	13.4	
40	316	34.8		-11	10.0		302	45.4		-15	56.9		288	31.9		-19	37.7		274	6.1		-21	56.6		259	46.7		-22	47.1		245	54.0		-22	12.3	
10 0	321	23.5	288.7	-11	14.4	-4.3	307	33.7	288.3	-16	0.5	-3.5	293	19.9	288.0	-19	40.2	-2.5	278	54.0	288.0	-21	57.9	-1.3	264	34.9	288.2	-22	47.2	-0.1	250	42.7	288.7	-22	11.3	1.1
20	326	12.2		-11	18.7		312	21.9		-16	4.0		298	7.9		-19	42.7		283	42.0		-21	59.2		269	23.2		-22	47.3		255	31.4		-22	10.2	
40	331	0.8		-11	23.0		317	10.2		-16	7.5		302	55.9		-19	45.2		288	30.0		-22	0.5		274	11.4		-22	47.3		260	20.1		-22	9.2	
11 0	335	49.5	288.6	-11	27.3	-4.3	321	58.5	288.3	-16	11.1	-3.5	307	43.9	288.0	-19	47.6	-2.4	293	18.0	288.0	-22	1.7	-1.2	278	59.6	288.2	-22	47.4	0.0	265	8.9	288.7	-22	8.1	1.1
20	340	38.1		-11	31.6		326	46.8		-16	14.6		312	31.9		-19	50.1		298	5.9		-22	3.0		283	47.8		-22	47.4		269	57.6		-22	7.0	
40	345	26.8		-11	35.9		331	35.1		-16	18.1		317	19.9		-19	52.5		302	53.9		-22	4.2		288	36.1		-22	47.4		274	46.3		-22	5.9	
12 0	350	15.4	288.6	-11	40.2	-4.3	336	23.3	288.3	-16	21.6	-3.4	322	8.0	288.0	-19	54.9	-2.4	307	41.9	288.0	-22	5.4	-1.2	293	24.3	288.3	-22	47.4	0.1	279	35.1	288.8	-22	4.7	1.1
20	355	4.0		-11	44.5		341	11.6		-16	25.0		326	56.0		-19	57.4		312	29.9		-22	6.6		298	12.6		-22	47.3		284	23.8		-22	3.6	
40	359	52.6		-11	48.8		345	59.8		-16	28.5		331	44.0		-19	59.7		317	17.9		-22	7.8		303	0.8		-22	47.3		289	12.6		-22	2.4	
13 0	4	41.3	288.6	-11	53.0	-4.3	350	48.1	288.2	-16	31.9	-3.4	336	32.0	288.0	-20	2.1	-2.3	322	5.8	288.0	-22	8.9	-1.1	307	49.1	288.3	-22	47.2	0.1	294	1.4	288.8	-22	1.3	1.2
20	9	29.9		-11	57.3		355	36.3		-16	35.4		341	20.0		-20	4.5		326	53.8		-22	10.1		312	37.3		-22	47.2		298	50.2		-22	0.1	
40	14	18.5		-12	1.5		0	24.6		-16	38.8		346	8.0		-20	6.8		331	41.8		-22	11.2		317	25.6		-22	47.1		303	39.0		-21	58.9	
14 0	19	7.1	288.6	-12	5.8	-4.2	5	12.8	288.2	-16	42.2	-3.4	350	56.0	288.0	-20	9.1	-2.3	336	29.8	288.0	-22	12.3	-1.1	322	13.9	288.3	-22	46.9	0.1	308	27.8	288.8	-21	57.7	1.3
20	23	55.7		-12	10.0		10	1.0		-16	45.6		355	44.0		-20	11.4		341	17.8		-22	13.4		327	2.2		-22	46.8		313	16.6		-21	56.4	
40	28	44.3		-12	14.2		14	49.3		-16	49.0		0	31.9		-20	13.7		346	5.8		-22	14.4		331	50.4		-22	46.7		318	5.4		-21	55.2	
15 0	33	32.9	288.6	-12	18.4	-4.2	19	37.5	288.2	-16	52.3	-3.4	5	19.9	288.0	-20	16.0	-2.2	350	53.8	288.0	-22	15.5	-1.0	336	38.7	288.3	-22	46.5	0.2	322	54.2	288.8	-21	53.9	1.3
20	38	21.5		-12	22.6		24	25.7		-16	55.7		10	7.9		-20	18.3		355	41.8		-22	16.5		341	27.0		-22	46.3		327	43.1		-21	52.7	
40	43	10.0		-12	26.8		29	13.9		-16	59.0		14	55.9		-20	20.5		0	29.8		-22	17.6		346	15.3		-22	46.1		332	31.9		-21	51.4	
16 0	47	58.6	288.6	-12	31.0	-4.1	34	2.1	288.2	-17	2.4	-3.3	19	43.9	288.0	-20	22.7	-2.2	5	17.8	288.0	-22	18.6	-1.0	351	3.7	288.3	-22	45.9	0.2	337	20.8	288.9	-21	50.1	1.3
20	52	47.2		-12	35.1		38	50.3		-17	5.7		24	31.9		-20	24.9		10	5.8		-22	19.5		355	52.0		-22	45.7		342	9.6		-21	48.8	
40	57	35.7		-12	39.3		43	38.5		-17	9.0		29	19.9		-20	27.1		14	53.8		-22	20.5		0	40.3		-22	45.5		346	58.5		-21	47.5	
17 0	62	24.3	288.5	-12	43.4	-4.1	48	26.7	288.2	-17	12.2	-3.3	34	7.8	288.0	-20	29.3	-2.1	19	41.8	288.0	-22	21.5	-0.9	5	28.6	288.3	-22	45.2	0.3	351	47.4	288.9	-21	46.1	1.4
20	67	12.8		-12	47.6		53	14.9		-17	15.5		38	55.8		-20	31.5		24	29.9		-22	22.4		10	17.0		-22	44.9		356	36.3		-21	44.8	
40	72	1.4		-12	51.7		58	3.1		-17	18.8		43	43.8		-20	33.6		29	17.9		-22	23.3		15	5.3		-22	44.6		1	25.2		-21	43.4	
18 0	76	49.9	288.5	-12	55.8	-4.1	62	51.3	288.2	-17	22.0	-3.2	48	31.8	288.0	-20	35.7	-2.1	34	5.9	288.0	-22	24.2	-0.9	19	53.7	288.4	-22	44.3	0.3	6	14.1	288.9	-21	42.0	1.4
20	81	38.4		-12	59.9		67	39.5		-17	25.2		53	19.7		-20	37.8		38	53.9		-22	25.1		24	42.0		-22	44.0		11	3.0		-21	40.6	
40	86	27.0		-13	4.0		72	27.7		-17	28.5		58	7.7		-20	39.9		43	41.9		-22	25.9		29	30.4		-22	43.7		15	51.9		-21	39.2	
19 0	91	15.5	288.5	-13	8.1	-4.1	77	15.8	288.2	-17	31.6	-3.2	62	55.7	288.0	-20	42.0	-2.0	48	30.0	288.0	-22	26.8	-0.8	34	18.7	288.4	-22	43.3	0.4	20	40.8	288.9	-21	37.8	1.4
20	96	4.0		-13	12.2		82	4.0		-17	34.8		67	43.7		-20	44.1		53	18.0		-22	27.6		39	7.1		-22	42.9		25	29.8		-21	36.4	
40	100	52.5		-13	16.3		86	52.2		-17	38.0		72	31.6		-20	46.1		58	6.0		-22	28.4		43	55.5		-22	42.5		30	18.7		-21	34.9	
20 0	105	41.0	288.5	-13	20.3	-4.0	91	40.3	288.2	-17	41.2	-3.1	77	19.6	288.0	-20	48.1	-2.0	62	54.1	288.0	-22	29.2	-0.8	48	43.9	288.4	-22	42.1	0.4	35	7.7	289.0	-21	33.5	1.5
20	110	29.5		-13	24.4		96	28.5		-17	44.3		82	7.6		-20	50.1		67	42.1		-22	30.0		53	32.3		-22	41.7		39	56.7		-21	32.0	
40	115	18.0		-13	28.4		101	16.7		-17	47.4		86	55.5		-20	52.1		72	30.1		-22	30.8		58	20.7		-22	41.3		44	45.6		-21	30.5	
21 0	120	6.5	288.5	-13	32.4	-4.0	106	4.8	288.1	-17	50.5	-3.1	91	43.5	288.0	-20	54.1	-1.9	77	18.2	288.1	-22	31.5	-0.7	63	9.1	288.4	-22	40.8	0.5	49	34.6	289.0	-21	29.0	1.5
20	124	55.0		-13	36.4		110	52.9		-17	53.6		96	31.5		-20	56.1		82	6.2		-22	32.2		67	57.5		-22	40.4		54	23.6		-21	27.5	
40	129	43.5		-13	40.4		115	41.1		-17	56.7		101	19.4		-20	58.0		86	54.3		-22	32.9		72	45.9		-22	39.9		59	12.6		-21	26.0	
22 0	134	32.0	288.5	-13	44.4	-4.0	120	29.2	288.1	-17	59.8	-3.0	106	7.4	288.0	-20	59.9	-1.9	91	42.3	288.1	-22	33.6	-0.7	77	34.4	288.4	-22	39.4	0.5	64	1.6	289.0	-21	24.4	1.6
20	139	20.4		-13	48.4		125	17.4		-18	2.8		110	55.4		-21	1.8		96	30.4		-22	34.3		82	22.8		-22	38.9		68	50.7		-21	22.9	
40	144	8.9		-13	52.4		130	5.5		-18	5.9		115	43.3		-21	3.7		101	18.5		-22	35.0		87	11.2		-22	38.3		73	39.7		-21	21.3	
23 0	148	57.4	288.4	-13	56.3	-3.9	134	53.6	288.1	-18	8.9	-3.0	120	31.3	288.0	-21	5.6	-1.8	106	6.5	288.1	-22	35.6	-0.6	91	59.7	288.5	-22	37.8	0.6	78	28.7	289.1	-21	19.7	1.6
20	153	45.8		-14	0.3		139	41.7		-18	11.9		125	19.2		-21	7.5		110	54.6		-22	36.2		96	48.1		-22	37.2		83	17.8		-21	18.1	
40	158	34.3		-14	4.2		144	29.8		-18	14.9		130	7.2		-21	9.3		115	42.7		-22	36.8		101	36.6		-22	36.7		88	6.9		-21	16.5	

2011 Moon

	4 Oct						5 Oct						6 Oct						7 Oct						8 Oct						9 Oct					
	GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec		
h m	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'
0 0	92	55.9	289.1	-21	14.9	1.6	80	13.4	289.8	-18	47.0	2.5	68	19.1	290.4	-15	27.4	3.1	57	7.5	290.9	-11	30.5	3.5	46	29.5	291.3	-7	9.1	3.8	36	14.1	291.6	-2	34.6	3.9
20	97	45.0		-21	13.3		85	3.2		-18	44.6		73	9.5		-15	24.3		61	58.4		-11	27.0		51	20.8		-7	5.3		41	5.6		-2	30.7	
40	102	34.1		-21	11.6		89	53.0		-18	42.1		77	59.9		-15	21.3		66	49.4		-11	23.5		56	12.1		-7	1.6		45	57.2		-2	26.9	
1 0	107	23.2	289.1	-21	10.0	1.7	94	42.7	289.8	-18	39.6	2.5	82	50.3	290.4	-15	18.2	3.1	71	40.3	291.0	-11	20.0	3.5	61	3.5	291.3	-6	57.8	3.7	50	48.7	291.6	-2	23.0	3.8
20	112	12.3		-21	8.3		99	32.5		-18	37.2		87	40.7		-15	15.1		76	31.3		-11	16.5		65	54.8		-6	54.1		55	40.3		-2	19.2	
40	117	1.4		-21	6.6		104	22.3		-18	34.7		92	31.1		-15	12.0		81	22.2		-11	13.0		70	46.2		-6	50.3		60	31.9		-2	15.3	
2 0	121	50.5	289.1	-21	4.9	1.7	109	12.1	289.8	-18	32.2	2.5	97	21.6	290.5	-15	8.9	3.1	86	13.2	291.0	-11	9.5	3.5	75	37.5	291.4	-6	46.6	3.8	65	23.4	291.6	-2	11.5	3.9
20	126	39.7		-21	3.2		114	1.9		-18	29.7		102	12.0		-15	5.8		91	4.2		-11	5.9		80	28.9		-6	42.8		70	15.0		-2	7.6	
40	131	28.8		-21	1.5		118	51.7		-18	27.1		107	2.5		-15	2.7		95	55.2		-11	2.4		85	20.2		-6	39.0		75	6.6		-2	3.7	
3 0	136	18.0	289.2	-20	59.8	1.8	123	41.6	289.8	-18	24.6	2.5	111	52.9	290.5	-14	59.6	3.2	100	46.1	291.0	-10	58.9	3.5	90	11.6	291.4	-6	35.3	3.8	79	58.2	291.6	-1	59.9	3.9
20	141	7.1		-20	58.0		128	31.4		-18	22.1		116	43.4		-14	56.4		105	37.1		-10	55.4		95	2.9		-6	31.5		84	49.7		-1	56.0	
40	145	56.3		-20	56.3		133	21.2		-18	19.5		121	33.9		-14	53.3		110	28.1		-10	51.8		99	54.3		-6	27.7		89	41.3		-1	52.2	
4 0	150	45.5	289.2	-20	54.5	1.8	138	11.1	289.9	-18	17.0	2.6	126	24.4	290.5	-14	50.1	3.1	115	19.1	291.0	-10	48.3	3.6	104	45.7	291.4	-6	24.0	3.8	94	32.9	291.6	-1	48.3	3.9
20	155	34.6		-20	52.7		143	1.0		-18	14.4		131	14.9		-14	47.0		120	10.1		-10	44.7		109	37.0		-6	20.2		99	24.5		-1	44.4	
40	160	23.8		-20	50.9		147	50.8		-18	11.8		136	5.4		-14	43.8		125	1.2		-10	41.2		114	28.4		-6	16.4		104	16.1		-1	40.6	
5 0	165	13.1	289.2	-20	49.1	1.8	152	40.7	289.9	-18	9.2	2.6	140	55.9	290.5	-14	40.7	3.2	129	52.2	291.0	-10	37.6	3.6	119	19.8	291.4	-6	12.6	3.8	109	7.6	291.6	-1	36.7	3.9
20	170	2.3		-20	47.3		157	30.6		-18	6.6		145	46.4		-14	37.5		134	43.2		-10	34.1		124	11.2		-6	8.9		113	59.2		-1	32.8	
40	174	51.5		-20	45.5		162	20.5		-18	4.0		150	36.9		-14	34.3		139	34.2		-10	30.5		129	2.6		-6	5.1		118	50.8		-1	29.0	
6 0	179	40.7	289.3	-20	43.6	1.9	167	10.4	289.9	-18	1.4	2.6	155	27.5	290.6	-14	31.1	3.2	144	25.3	291.1	-10	26.9	3.6	133	54.0	291.4	-6	1.3	3.8	123	42.4	291.6	-1	25.1	3.9
20	184	30.0		-20	41.8		172	0.4		-17	58.8		160	18.0		-14	28.0		149	16.3		-10	23.4		138	45.4		-5	57.5		128	34.0		-1	21.3	
40	189	19.2		-20	39.9		176	50.3		-17	56.1		165	8.6		-14	24.8		154	7.4		-10	19.8		143	36.8		-5	53.7		133	25.6		-1	17.4	
7 0	194	8.5	289.3	-20	38.0	1.9	181	40.2	290.0	-17	53.5	2.7	169	59.1	290.6	-14	21.6	3.2	158	58.4	291.1	-10	16.2	3.6	148	28.2	291.4	-5	49.9	3.8	138	17.2	291.6	-1	13.5	3.8
20	198	57.8		-20	36.1		186	30.2		-17	50.8		174	49.7		-14	18.3		163	49.5		-10	12.6		153	19.6		-5	46.1		143	8.8		-1	9.7	
40	203	47.0		-20	34.2		191	20.1		-17	48.2		179	40.3		-14	15.1		168	40.6		-10	9.1		158	11.0		-5	42.3		148	0.4		-1	5.8	
8 0	208	36.3	289.3	-20	32.3	1.9	196	10.1	290.0	-17	45.5	2.7	184	30.9	290.6	-14	11.9	3.2	173	31.6	291.1	-10	5.5	3.6	163	2.4	291.4	-5	38.5	3.8	152	52.0	291.6	-1	2.0	3.9
20	213	25.6		-20	30.4		201	0.1		-17	42.8		189	21.4		-14	8.7		178	22.7		-10	1.9		167	53.8		-5	34.7		157	43.6		-0	58.1	
40	218	14.9		-20	28.4		205	50.1		-17	40.1		194	12.0		-14	5.4		183	13.8		-9	58.3		172	45.2		-5	30.9		162	35.2		-0	54.2	
9 0	223	4.3	289.3	-20	26.5	2.0	210	40.1	290.0	-17	37.4	2.7	199	2.6	290.6	-14	2.2	3.3	188	4.9	291.1	-9	54.7	3.6	177	36.7	291.4	-5	27.1	3.8	167	26.8	291.6	-0	50.4	3.9
20	227	53.6		-20	24.5		215	30.1		-17	34.7		203	53.3		-13	59.0		192	56.0		-9	51.1		182	28.1		-5	23.3		172	18.4		-0	46.5	
40	232	42.9		-20	22.5		220	20.1		-17	32.0		208	43.9		-13	55.7		197	47.1		-9	47.5		187	19.5		-5	19.5		177	10.0		-0	42.6	
10 0	237	32.3	289.4	-20	20.6	2.0	225	10.1	290.0	-17	29.3	2.7	213	34.5	290.6	-13	52.4	3.3	202	38.2	291.1	-9	43.9	3.6	192	11.0	291.4	-5	15.7	3.8	182	1.6	291.6	-0	38.8	3.9
20	242	21.6		-20	18.6		230	0.1		-17	26.6		218	25.2		-13	49.2		207	29.3		-9	40.2		197	2.4		-5	11.9		186	53.2		-0	34.9	
40	247	11.0		-20	16.5		234	50.2		-17	23.8		223	15.8		-13	45.9		212	20.4		-9	36.6		201	53.9		-5	8.1		191	44.8		-0	31.1	
11 0	252	0.4	289.4	-20	14.5	2.0	239	40.2	290.1	-17	21.1	2.8	228	6.4	290.7	-13	42.6	3.3	217	11.6	291.1	-9	33.0	3.6	206	45.3	291.5	-5	4.3	3.8	196	36.4	291.6	-0	27.2	3.9
20	256	49.8		-20	12.5		244	30.3		-17	18.3		232	57.1		-13	39.3		222	2.7		-9	29.4		211	36.8		-5	0.5		201	28.1		-0	23.3	
40	261	39.2		-20	10.4		249	20.4		-17	15.5		237	47.8		-13	36.1		226	53.8		-9	25.7		216	28.2		-4	56.6		206	19.7		-0	19.5	
12 0	266	28.6	289.4	-20	8.4	2.1	254	10.4	290.1	-17	12.8	2.8	242	38.4	290.7	-13	32.8	3.3	231	45.0	291.2	-9	22.1	3.6	221	19.7	291.5	-4	52.8	3.8	211	11.3	291.6	-0	15.6	3.9
20	271	18.0		-20	6.3		259	0.5		-17	10.0		247	29.1		-13	29.5		236	36.1		-9	18.5		226	11.1		-4	49.0		216	2.9		-0	11.8	
40	276	7.4		-20	4.2		263	50.6		-17	7.2		252	19.8		-13	26.1		241	27.3		-9	14.8		231	2.6		-4	45.2		220	54.5		-0	7.9	
13 0	280	56.8	289.5	-20	2.1	2.1	268	40.7	290.1	-17	4.4	2.8	257	10.5	290.7	-13	22.8	3.3	246	18.4	291.2	-9	11.2	3.7	235	54.1	291.5	-4	41.4	3.8	225	46.1	291.6	-0	4.0	3.8
20	285	46.3		-20	0.0		273	30.8		-17	1.6		262	1.2		-13	19.5		251	9.6		-9	7.5		240	45.5		-4	37.5		230	37.8		-0	0.2	
40	290	35.7		-19	57.9		278	21.0		-16	58.7		266	51.9		-13	16.2		256	0.8		-9	3.9		245	37.0		-4	33.7		235	29.4		0	3.7	
14 0	295	25.2	289.5	-19	55.8	2.1	283	11.1	290.1	-16	55.9	2.8	271	42.7	290.7	-13	12.9	3.4	260	51.9	291.2	-9	0.2	3.7	250	28.5	291.5	-4	29.9	3.8	240	21.0	291.6	0	7.5	3.9
20	300	14.7		-19	53.7		288	1.2		-16	53.1		276	33.4		-13	9.5		265	43.1		-8	56.6		255	20.0		-4	26.1		245	12.6		0	11.4	
40	305	4.1		-19	51.5		292	51.4		-16	50.2		281	24.1		-13	6.2		270	34.3		-8	52.9		260	11.4		-4	22.2		250	4.2		0	15.2	
15 0	309	53.6	289.5	-19	49.4	2.2	297	41.5	290.2	-16	47.4	2.9	286	14.9	290.8	-13	2.8	3.3	275	25.5	291.2	-8	49.2	3.7	265	2.9	291.5	-4	18.4	3.8	254	55.9	291.6	0	19.1	3.9
20	314	43.1		-19	47.2		302	31.7		-16	44.5		291	5.6		-12	59.5		280	16.7		-8	45.6		269	54.4		-4	14.6		259	47.5		0	22.9	
40	319	32.6		-19	45.0		307	21.9		-16	41.7		295	56.4		-12	56.1		285	7.9		-8	41.9		274	45.9		-4	10.7		264	39.1		0	26.8	
16 0	324	22.2	289.5	-19	42.8	2.2	312	12.1	290.2	-16	38.8	2.9	300	47.1	290.8	-12	52.8	3.4	289	59.1	291.2	-8	38.2	3.7	279	37.4	291.5	-4	6.9	3.8	269	30.7	291.6	0	30.7	3.8
20	329	11.7		-19	40.6		317	2.2		-16	35.9		305	37.9		-12	49.4		294	50.3		-8	34.5		284	28.9		-4	3.1		274	22.4		0	34.5	
40	334	1.2		-19	38.4		321	52.5		-16	33.0		310	28.7		-12	46.0		299	41.5		-8	30.8		289	20.4		-3	59.2		279	14.0		0	38.4	
17 0	338	50.8	289.6	-19	36.2	2.3	326	42.7	290.2	-16	30.1	2.9	315	19.4	290.8	-12	42.6	3.4	304	32.7	291.2	-8	27.2	3.7	294	11.9	291.5	-3	55.4	3.8	284	5.6	291.6	0	42.2	3.9
20	343	40.3		-19	33.9		331	32.9		-16	27.2		320	10.2		-12	39.3		309	24.0		-8	23.5		299	3.4		-3	51.6		288	57.3		0	46.1	
40	348	29.9		-19	31.7		336	23.1		-16	24.3		325	1.0		-12	35.9		314	15.2		-8	19.8		303	54.9		-3	47.7		293	48.9		0	49.9	
18 0	353	19.5	289.6	-19	29.4	2.3	341	13.3	290.3	-16	21.4	3.0	329	51.8	290.8	-12	32.5	3.4	319	6.4	291.2	-8	16.1	3.7	308	46.4	291.5	-3	43.9	3.8	298	40.5	291.6	0	53.8	3.8
20	358	9.0		-19	27.2		346	3.6		-16	18.4		334	42.7		-12	29.1		323	57.7		-8	12.4		313	37.9		-3	40.0		303	32.2		0	57.6	
40	2	58.6		-19	24.9		350	53.8		-16	15.5		339	33.5		-12	25.7		328	48.9		-8	8.7		318	29.5		-3	36.2		308	23.8		1	1.5	
19 0	7	48.2	289.6	-19	22.6	2.3	355	44.1	290.3	-16	12.5	3.0	344	24.3	290.8	-12	22.2	3.4	333	40.2	291.3	-8	5.0	3.7	323	21.0	291.5	-3	32.4	3.9	313	15.4	291.6	1	5.3	3.8
20	12	37.9		-19	20.3		0	34.4		-16	9.6		349	15.1		-12	18.8		338	31.4		-8	1.3		328	12.5		-3	28.5		318	7.1		1	9.2	
40	17	27.5		-19	18.0		5	24.7		-16	6.6		354	6.0		-12	15.4		343	22.7		-7	57.6		333	4.0		-3	24.7		322	58.7		1	13.0	
20 0	22	17.1	289.7	-19	15.7	2.3	10	14.9	290.3	-16	3.6	3.0	358	56.8	290.9	-12	12.0	3.4	348	14.0	291.3	-7	53.9	3.7	337	55.6	291.5	-3	20.8	3.8	327	50.3	291.6	1	16.8	3.9
20	27	6.8		-19	13.3		15	5.2		-16	0.7		3	47.7		-12	8.5		353	5.2		-7	50.1		342	47.1		-3	17.0		332	42.0		1	20.7	
40	31	56.4		-19	11.0		19	55.5		-15	57.7		8	38.5		-12	5.1		357	56.5		-7	46.4		347	38.6		-3	13.1		337	33.6		1	24.5	
21 0	36	46.1	289.7	-19	8.7	2.4	24	45.9	290.3	-15	54.7	3.0	13	29.4	290.9	-12	1.7	3.5	2	47.8	291.3	-7	42.7	3.7	352	30.1	291.5	-3	9.3	3.9	342	25.2	291.6	1	28.4	3.8
20	41	35.7		-19	6.3		29	36.2		-15	51.7		18	20.3		-11	58.2		7	39.1		-7	39.0		357	21.7		-3	5.4		347	16.9		1	32.2	
40	46	25.4		-19	3.9		34	26.5		-15	48.7		23	11.2		-11	54.8		12	30.4		-7	35.3		2	13.2		-3	1.6		352	8.5		1	36.0	
22 0	51	15.1	289.7	-19	1.5	2.4	39	16.8	290.4	-15	45.7	3.0	28	2.0	290.9	-11	51.3	3.5	17	21.6	291.3	-7	31.5	3.7	7	4.8	291.5	-2	57.7	3.8	357	0.1	291.6	1	39.9	3.8
20	56	4.8		-18	59.1		44	7.2		-15	42.6		32	52.9		-11	47.9		22	12.9		-7	27.8		11	56.3		-2	53.9		1	51.8		1	43.7	
40	60	54.5		-18	56.7		48	57.6		-15	39.6		37	43.8		-11	44.4		27	4.2		-7	24.1		16	47.9		-2	50.0		6	43.4		1	47.6	
23 0	65	44.2	289.7	-18	54.3	2.4	53	47.9	290.4	-15	36.6	3.1	42	34.7	290.9	-11	40.9	3.5	31	55.6	291.3	-7	20.3	3.7	21	39.4	291.6	-2	46.2	3.9	11	35.0	291.6	1	51.4	3.8
20	70	34.0		-18	51.9		58	38.3		-15	33.5		47	25.7		-11	37.4		36	46.9		-7	16.6		26	31.0		-2	42.3		16	26.7		1	55.2	
40	75	23.7		-18	49.5		63	28.7		-15	30.5		52	16.6		-11	34.0		41	38.2		-7	12.8		31	22.5		-2	38.5		21	18.3		1	59.1	

2011 Moon

	10 Oct						11 Oct						12 Oct						13 Oct						14 Oct						15 Oct					
	GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec		
h m	o	'	d	o	'	d '	o	'	d	o	'	d '	o	'	d	o	'	d '	o	'	d	o	'	d '	o	'	d	o	'	d '	o	'	d	o	'	d '
0 0	26	10.0	291.6	2	2.9	3.8	16	6.4	291.6	6	33.8	3.7	5	53.7	291.4	10	48.9	3.4	355	23.8	291.1	14	38.6	2.9	344	30.6	290.7	17	53.4	2.4	333	11.2	290.4	20	24.1	1.7
20	31	1.6		2	6.7		20	58.0		6	37.5		10	45.1		10	52.2		0	14.9		14	41.5		349	21.3		17	55.8		338	1.6		20	25.8	
40	35	53.2		2	10.5		25	49.6		6	41.2		15	36.5		10	55.6		5	6.0		14	44.5		354	12.0		17	58.2		342	51.9		20	27.5	
1 0	40	44.9	291.6	2	14.4	3.8	30	41.1	291.6	6	44.8	3.7	20	27.9	291.4	10	59.0	3.4	9	57.0	291.1	14	47.4	3.0	359	2.8	290.7	18	0.6	2.4	347	42.3	290.4	20	29.2	1.7
20	45	36.5		2	18.2		35	32.7		6	48.5		25	19.3		11	2.4		14	48.1		14	50.4		3	53.5		18	3.0		352	32.7		20	30.9	
40	50	28.1		2	22.0		40	24.3		6	52.1		30	10.6		11	5.7		19	39.2		14	53.3		8	44.2		18	5.4		357	23.0		20	32.6	
2 0	55	19.8	291.6	2	25.8	3.8	45	15.8	291.6	6	55.8	3.7	35	2.0	291.4	11	9.1	3.3	24	30.3	291.1	14	56.3	2.9	13	35.0	290.7	18	7.8	2.4	2	13.4	290.3	20	34.3	1.7
20	60	11.4		2	29.7		50	7.4		6	59.5		39	53.4		11	12.4		29	21.4		14	59.2		18	25.7		18	10.2		7	3.7		20	36.0	
40	65	3.1		2	33.5		54	59.0		7	3.1		44	44.7		11	15.8		34	12.4		15	2.1		23	16.4		18	12.5		11	54.1		20	37.7	
3 0	69	54.7	291.6	2	37.3	3.8	59	50.5	291.6	7	6.8	3.6	49	36.1	291.4	11	19.1	3.4	39	3.5	291.1	15	5.0	2.9	28	7.1	290.7	18	14.9	2.3	16	44.4	290.3	20	39.3	1.6
20	74	46.3		2	41.1		64	42.1		7	10.4		54	27.4		11	22.5		43	54.5		15	7.9		32	57.8		18	17.2		21	34.8		20	41.0	
40	79	38.0		2	44.9		69	33.6		7	14.0		59	18.8		11	25.8		48	45.6		15	10.8		37	48.5		18	19.5		26	25.1		20	42.6	
4 0	84	29.6	291.6	2	48.7	3.8	74	25.2	291.5	7	17.7	3.6	64	10.1	291.3	11	29.2	3.3	53	36.6	291.0	15	13.7	2.9	42	39.2	290.7	18	21.8	2.3	31	15.4	290.3	20	44.2	1.6
20	89	21.2		2	52.6		79	16.7		7	21.3		69	1.5		11	32.5		58	27.7		15	16.6		47	29.9		18	24.2		36	5.7		20	45.8	
40	94	12.9		2	56.4		84	8.3		7	24.9		73	52.8		11	35.8		63	18.7		15	19.5		52	20.5		18	26.5		40	56.1		20	47.4	
5 0	99	4.5	291.6	3	0.2	3.8	88	59.8	291.5	7	28.6	3.6	78	44.2	291.3	11	39.1	3.3	68	9.7	291.0	15	22.4	2.8	57	11.2	290.7	18	28.8	2.3	45	46.4	290.3	20	49.0	1.6
20	103	56.1		3	4.0		93	51.4		7	32.2		83	35.5		11	42.4		73	0.8		15	25.2		62	1.9		18	31.0		50	36.7		20	50.6	
40	108	47.8		3	7.8		98	42.9		7	35.8		88	26.8		11	45.7		77	51.8		15	28.1		66	52.5		18	33.3		55	27.0		20	52.2	
6 0	113	39.4	291.6	3	11.6	3.8	103	34.5	291.5	7	39.4	3.6	93	18.2	291.3	11	49.0	3.3	82	42.8	291.0	15	30.9	2.8	71	43.2	290.6	18	35.6	2.2	60	17.3	290.3	20	53.8	1.5
20	118	31.1		3	15.4		108	26.0		7	43.0		98	9.5		11	52.3		87	33.8		15	33.8		76	33.9		18	37.8		65	7.6		20	55.3	
40	123	22.7		3	19.2		113	17.5		7	46.7		103	0.8		11	55.6		92	24.8		15	36.6		81	24.5		18	40.1		69	57.9		20	56.8	
7 0	128	14.3	291.6	3	23.0	3.8	118	9.1	291.5	7	50.3	3.6	107	52.1	291.3	11	58.9	3.3	97	15.8	291.0	15	39.4	2.8	86	15.1	290.6	18	42.3	2.2	74	48.1	290.3	20	58.4	1.5
20	133	6.0		3	26.8		123	0.6		7	53.9		112	43.4		12	2.2		102	6.8		15	42.2		91	5.8		18	44.6		79	38.4		20	59.9	
40	137	57.6		3	30.6		127	52.1		7	57.5		117	34.7		12	5.4		106	57.8		15	45.1		95	56.4		18	46.8		84	28.7		21	1.4	
8 0	142	49.2	291.6	3	34.4	3.8	132	43.7	291.5	8	1.1	3.6	122	26.0	291.3	12	8.7	3.3	111	48.8	291.0	15	47.9	2.8	100	47.0	290.6	18	49.0	2.2	89	19.0	290.3	21	2.9	1.5
20	147	40.8		3	38.2		137	35.2		8	4.6		127	17.3		12	12.0		116	39.8		15	50.7		105	37.7		18	51.2		94	9.2		21	4.4	
40	152	32.5		3	42.0		142	26.7		8	8.2		132	8.6		12	15.2		121	30.8		15	53.5		110	28.3		18	53.4		98	59.5		21	5.9	
9 0	157	24.1	291.6	3	45.8	3.8	147	18.2	291.5	8	11.8	3.6	136	59.9	291.3	12	18.5	3.2	126	21.8	291.0	15	56.2	2.8	115	18.9	290.6	18	55.6	2.2	103	49.7	290.2	21	7.3	1.5
20	162	15.7		3	49.5		152	9.7		8	15.4		141	51.2		12	21.7		131	12.7		15	59.0		120	9.5		18	57.8		108	40.0		21	8.8	
40	167	7.4		3	53.3		157	1.3		8	19.0		146	42.5		12	25.0		136	3.7		16	1.8		125	0.1		18	59.9		113	30.2		21	10.2	
10 0	171	59.0	291.6	3	57.1	3.8	161	52.8	291.5	8	22.5	3.6	151	33.8	291.3	12	28.2	3.2	140	54.7	291.0	16	4.5	2.8	129	50.7	290.6	19	2.1	2.1	118	20.5	290.2	21	11.7	1.4
20	176	50.6		4	0.9		166	44.3		8	26.1		156	25.0		12	31.4		145	45.6		16	7.3		134	41.3		19	4.2		123	10.7		21	13.1	
40	181	42.3		4	4.7		171	35.8		8	29.7		161	16.3		12	34.6		150	36.6		16	10.0		139	31.9		19	6.4		128	0.9		21	14.5	
11 0	186	33.9	291.6	4	8.4	3.8	176	27.3	291.5	8	33.2	3.6	166	7.6	291.3	12	37.9	3.2	155	27.5	290.9	16	12.8	2.7	144	22.5	290.6	19	8.5	2.1	132	51.2	290.2	21	15.9	1.4
20	191	25.5		4	12.2		181	18.8		8	36.8		170	58.8		12	41.1		160	18.5		16	15.5		149	13.0		19	10.6		137	41.4		21	17.3	
40	196	17.1		4	16.0		186	10.3		8	40.4		175	50.1		12	44.3		165	9.4		16	18.2		154	3.6		19	12.7		142	31.6		21	18.7	
12 0	201	8.8	291.6	4	19.8	3.7	191	1.8	291.5	8	43.9	3.5	180	41.4	291.2	12	47.5	3.2	170	0.3	290.9	16	20.9	2.7	158	54.2	290.6	19	14.8	2.1	147	21.8	290.2	21	20.0	1.4
20	206	0.4		4	23.5		195	53.3		8	47.5		185	32.6		12	50.7		174	51.3		16	23.7		163	44.7		19	16.9		152	12.0		21	21.4	
40	210	52.0		4	27.3		200	44.8		8	51.0		190	23.9		12	53.8		179	42.2		16	26.4		168	35.3		19	19.0		157	2.2		21	22.7	
13 0	215	43.6	291.6	4	31.0	3.8	205	36.3	291.5	8	54.5	3.5	195	15.1	291.2	12	57.0	3.2	184	33.1	290.9	16	29.0	2.7	173	25.8	290.5	19	21.1	2.0	161	52.4	290.2	21	24.1	1.3
20	220	35.2		4	34.8		210	27.7		8	58.1		200	6.3		13	0.2		189	24.0		16	31.7		178	16.4		19	23.1		166	42.6		21	25.4	
40	225	26.9		4	38.6		215	19.2		9	1.6		204	57.6		13	3.4		194	14.9		16	34.4		183	6.9		19	25.2		171	32.8		21	26.7	
14 0	230	18.5	291.6	4	42.3	3.8	220	10.7	291.5	9	5.1	3.5	209	48.8	291.2	13	6.5	3.2	199	5.8	290.9	16	37.1	2.6	187	57.5	290.5	19	27.2	2.0	176	23.0	290.2	21	28.0	1.3
20	235	10.1		4	46.1		225	2.2		9	8.6		214	40.0		13	9.7		203	56.7		16	39.7		192	48.0		19	29.3		181	13.2		21	29.3	
40	240	1.7		4	49.8		229	53.7		9	12.2		219	31.3		13	12.8		208	47.6		16	42.4		197	38.5		19	31.3		186	3.4		21	30.6	
15 0	244	53.3	291.6	4	53.6	3.7	234	45.1	291.5	9	15.7	3.5	224	22.5	291.2	13	16.0	3.1	213	38.5	290.9	16	45.0	2.6	202	29.0	290.5	19	33.3	2.0	190	53.5	290.2	21	31.8	1.3
20	249	44.9		4	57.3		239	36.6		9	19.2		229	13.7		13	19.1		218	29.4		16	47.7		207	19.6		19	35.3		195	43.7		21	33.1	
40	254	36.5		5	1.1		244	28.1		9	22.7		234	4.9		13	22.3		223	20.3		16	50.3		212	10.1		19	37.3		200	33.9		21	34.3	
16 0	259	28.2	291.6	5	4.8	3.7	249	19.5	291.5	9	26.2	3.5	238	56.1	291.2	13	25.4	3.1	228	11.1	290.9	16	52.9	2.6	217	0.6	290.5	19	39.3	2.0	205	24.0	290.1	21	35.6	1.2
20	264	19.8		5	8.5		254	11.0		9	29.7		243	47.3		13	28.5		233	2.0		16	55.5		221	51.1		19	41.3		210	14.2		21	36.8	
40	269	11.4		5	12.3		259	2.4		9	33.2		248	38.5		13	31.6		237	52.9		16	58.2		226	41.6		19	43.3		215	4.3		21	38.0	
17 0	274	3.0	291.6	5	16.0	3.7	263	53.9	291.4	9	36.7	3.5	253	29.7	291.2	13	34.7	3.1	242	43.7	290.8	17	0.8	2.6	231	32.1	290.5	19	45.2	1.9	219	54.5	290.1	21	39.2	1.2
20	278	54.6		5	19.8		268	45.4		9	40.1		258	20.9		13	37.8		247	34.6		17	3.3		236	22.5		19	47.2		224	44.6		21	40.4	
40	283	46.2		5	23.5		273	36.8		9	43.6		263	12.1		13	40.9		252	25.4		17	5.9		241	13.0		19	49.1		229	34.7		21	41.6	
18 0	288	37.8	291.6	5	27.2	3.7	278	28.3	291.4	9	47.1	3.5	268	3.3	291.2	13	44.0	3.1	257	16.3	290.8	17	8.5	2.6	246	3.5	290.5	19	51.0	1.9	234	24.9	290.1	21	42.7	1.2
20	293	29.4		5	30.9		283	19.7		9	50.6		272	54.4		13	47.1		262	7.1		17	11.1		250	54.0		19	53.0		239	15.0		21	43.9	
40	298	21.0		5	34.7		288	11.1		9	54.0		277	45.6		13	50.2		266	57.9		17	13.6		255	44.4		19	54.9		244	5.1		21	45.0	
19 0	303	12.6	291.6	5	38.4	3.7	293	2.6	291.4	9	57.5	3.4	282	36.8	291.2	13	53.3	3.0	271	48.8	290.8	17	16.2	2.5	260	34.9	290.4	19	56.8	1.9	248	55.2	290.1	21	46.2	1.1
20	308	4.2		5	42.1		297	54.0		10	0.9		287	27.9		13	56.3		276	39.6		17	18.7		265	25.4		19	58.7		253	45.4		21	47.3	
40	312	55.8		5	45.8		302	45.4		10	4.4		292	19.1		13	59.4		281	30.4		17	21.2		270	15.8		20	0.5		258	35.5		21	48.4	
20 0	317	47.4	291.6	5	49.5	3.7	307	36.9	291.4	10	7.8	3.5	297	10.3	291.1	14	2.4	3.1	286	21.2	290.8	17	23.8	2.5	275	6.2	290.4	20	2.4	1.8	263	25.6	290.1	21	49.5	1.1
20	322	39.0		5	53.2		312	28.3		10	11.3		302	1.4		14	5.5		291	12.0		17	26.3		279	56.7		20	4.3		268	15.7		21	50.6	
40	327	30.6		5	56.9		317	19.7		10	14.7		306	52.6		14	8.5		296	2.8		17	28.8		284	47.1		20	6.1		273	5.8		21	51.7	
21 0	332	22.2	291.6	6	0.6	3.7	322	11.1	291.4	10	18.2	3.4	311	43.7	291.1	14	11.6	3.0	300	53.6	290.8	17	31.3	2.5	289	37.5	290.4	20	7.9	1.8	277	55.9	290.1	21	52.7	1.1
20	337	13.8		6	4.3		327	2.5		10	21.6		316	34.8		14	14.6		305	44.4		17	33.8		294	28.0		20	9.8		282	46.0		21	53.8	
40	342	5.4		6	8.0		331	54.0		10	25.0		321	26.0		14	17.6		310	35.2		17	36.3		299	18.4		20	11.6		287	36.1		21	54.8	
22 0	346	56.9	291.6	6	11.7	3.7	336	45.4	291.4	10	28.4	3.4	326	17.1	291.1	14	20.6	3.0	315	26.0	290.8	17	38.7	2.5	304	8.8	290.4	20	13.4	1.8	292	26.1	290.1	21	55.9	1.0
20	351	48.5		6	15.4		341	36.8		10	31.8		331	8.2		14	23.6		320	16.7		17	41.2		308	59.2		20	15.2		297	16.2		21	56.9	
40	356	40.1		6	19.1		346	28.2		10	35.3		335	59.3		14	26.6		325	7.5		17	43.7		313	49.6		20	17.0		302	6.3		21	57.9	
23 0	1	31.7	291.6	6	22.8	3.7	351	19.6	291.4	10	38.7	3.4	340	50.5	291.1	14	29.6	3.0	329	58.3	290.8	17	46.1	2.4	318	40.0	290.4	20	18.8	1.8	306	56.4	290.1	21	58.9	1.0
20	6	23.3		6	26.5		356	11.0		10	42.1		345	41.6		14	32.6		334	49.0		17	48.6		323	30.4		20	20.5		311	46.4		21	59.9	
40	11	14.8		6	30.1		1	2.4		10	45.5		350	32.7		14	35.6		339	39.8		17	51.0		328	20.8		20	22.3		316	36.5		22	0.8	

2011 Moon

	16 Oct						17 Oct						18 Oct						19 Oct						20 Oct						21 Oct					
	GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec		
h m	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'
0 0	321	26.5	290.0	22	1.8		309	21.3	289.8	22	39.5		297	2.9	289.7	22	12.6		284	40.0	289.7	20	39.3		272	19.0	289.7	18	1.3		260	3.0	289.8	14	23.7	
20	326	16.6		22	2.7	0.9	314	11.1		22	39.6	0.1	301	52.6		22	11.7	-0.9	289	29.6		20	37.5	-1.8	277	8.7		17	58.7	-2.6	264	52.8		14	20.3	-3.4
40	331	6.6		22	3.7		319	0.9		22	39.7		306	42.3		22	10.9		294	19.3		20	35.8		281	58.5		17	56.1		269	42.6		14	16.9	
1 0	335	56.7	290.0	22	4.6		323	50.7	289.8	22	39.7		311	32.0	289.7	22	10.0		299	9.0	289.7	20	34.0		286	48.2	289.7	17	53.4		274	32.4	289.8	14	13.4	
20	340	46.7		22	5.5	0.9	328	40.5		22	39.8	0.0	316	21.7		22	9.1	-0.9	303	58.7		20	32.2	-1.8	291	38.0		17	50.7	-2.7	279	22.2		14	10.0	-3.4
40	345	36.8		22	6.4		333	30.3		22	39.8		321	11.4		22	8.2		308	48.4		20	30.4		296	27.7		17	48.1		284	12.0		14	6.5	
2 0	350	26.8	290.0	22	7.3		338	20.1	289.8	22	39.8		326	1.1	289.7	22	7.3		313	38.1	289.7	20	28.5		301	17.4	289.7	17	45.4		289	1.8	289.8	14	3.1	
20	355	16.8		22	8.2	0.9	343	9.9		22	39.8	0.0	330	50.8		22	6.4	-0.9	318	27.7		20	26.7	-1.8	306	7.2		17	42.7	-2.7	293	51.6		13	59.6	-3.5
40	0	6.8		22	9.1		347	59.7		22	39.8		335	40.5		22	5.5		323	17.4		20	24.9		310	56.9		17	40.0		298	41.5		13	56.1	
3 0	4	56.9	290.0	22	9.9		352	49.5	289.8	22	39.8		340	30.2	289.7	22	4.5		328	7.1	289.7	20	23.0		315	46.7	289.8	17	37.3		303	31.3	289.8	13	52.6	
20	9	46.9		22	10.8	0.8	357	39.3		22	39.7	-0.1	345	19.9		22	3.6	-1.0	332	56.8		20	21.1	-1.9	320	36.4		17	34.5	-2.8	308	21.1		13	49.2	-3.5
40	14	36.9		22	11.6		2	29.1		22	39.7		350	9.5		22	2.6		337	46.5		20	19.2		325	26.2		17	31.8		313	10.9		13	45.6	
4 0	19	26.9	290.0	22	12.4		7	18.9	289.8	22	39.6		354	59.2	289.7	22	1.6		342	36.2	289.7	20	17.4		330	16.0	289.8	17	29.0		318	0.7	289.8	13	42.1	
20	24	16.9		22	13.2	0.8	12	8.7		22	39.6	-0.1	359	48.9		22	0.6	-1.0	347	25.9		20	15.4	-1.9	335	5.7		17	26.3	-2.8	322	50.5		13	38.6	-3.5
40	29	6.9		22	14.0		16	58.5		22	39.5		4	38.6		21	59.6		352	15.6		20	13.5		339	55.5		17	23.5		327	40.4		13	35.1	
5 0	33	56.9	290.0	22	14.8		21	48.2	289.8	22	39.4		9	28.3	289.7	21	58.6		357	5.3	289.7	20	11.6		344	45.2	289.8	17	20.7		332	30.2	289.8	13	31.5	
20	38	46.9		22	15.6	0.8	26	38.0		22	39.3	-0.1	14	18.0		21	57.6	-1.0	1	54.9		20	9.6	-2.0	349	35.0		17	17.9	-2.8	337	20.0		13	28.0	-3.6
40	43	36.9		22	16.3		31	27.8		22	39.1		19	7.6		21	56.5		6	44.6		20	7.7		354	24.7		17	15.1		342	9.8		13	24.4	
6 0	48	26.9	290.0	22	17.1		36	17.6	289.8	22	39.0		23	57.3	289.7	21	55.5		11	34.3	289.7	20	5.7		359	14.5	289.8	17	12.3		346	59.6	289.8	13	20.8	
20	53	16.9		22	17.8	0.7	41	7.4		22	38.8	-0.2	28	47.0		21	54.4	-1.1	16	24.0		20	3.7	-2.0	4	4.3		17	9.4	-2.9	351	49.4		13	17.2	-3.6
40	58	6.9		22	18.5		45	57.1		22	38.7		33	36.7		21	53.3		21	13.7		20	1.7		8	54.0		17	6.6		356	39.3		13	13.6	
7 0	62	56.8	290.0	22	19.3		50	46.9	289.8	22	38.5		38	26.4	289.7	21	52.2		26	3.4	289.7	19	59.7		13	43.8	289.8	17	3.7		1	29.1	289.8	13	10.0	
20	67	46.8		22	20.0	0.7	55	36.7		22	38.3	-0.2	43	16.1		21	51.1	-1.1	30	53.1		19	57.7	-2.0	18	33.5		17	0.8	-2.9	6	18.9		13	6.4	-3.6
40	72	36.8		22	20.7		60	26.4		22	38.1		48	5.7		21	50.0		35	42.8		19	55.7		23	23.3		16	58.0		11	8.7		13	2.8	
8 0	77	26.7	290.0	22	21.3		65	16.2	289.8	22	37.9		52	55.4	289.7	21	48.8		40	32.5	289.7	19	53.6		28	13.1	289.8	16	55.1		15	58.6	289.8	12	59.2	
20	82	16.7		22	22.0	0.7	70	6.0		22	37.7	-0.2	57	45.1		21	47.7	-1.1	45	22.2		19	51.6	-2.1	33	2.8		16	52.2	-2.9	20	48.4		12	55.5	-3.7
40	87	6.7		22	22.7		74	55.7		22	37.4		62	34.8		21	46.5		50	11.9		19	49.5		37	52.6		16	49.3		25	38.2		12	51.9	
9 0	91	56.6	289.9	22	23.3		79	45.5	289.8	22	37.2		67	24.5	289.7	21	45.4		55	1.6	289.7	19	47.4		42	42.4	289.8	16	46.3		30	28.0	289.8	12	48.2	
20	96	46.6		22	23.9	0.6	84	35.2		22	36.9	-0.3	72	14.1		21	44.2	-1.2	59	51.3		19	45.3	-2.1	47	32.1		16	43.4	-2.9	35	17.8		12	44.6	-3.7
40	101	36.5		22	24.5		89	25.0		22	36.6		77	3.8		21	43.0		64	41.0		19	43.2		52	21.9		16	40.5		40	7.7		12	40.9	
10 0	106	26.5	289.9	22	25.1		94	14.7	289.7	22	36.3		81	53.5	289.7	21	41.7		69	30.7	289.7	19	41.1		57	11.7	289.8	16	37.5		44	57.5	289.8	12	37.2	
20	111	16.4		22	25.7	0.6	99	4.5		22	36.0	-0.3	86	43.2		21	40.5	-1.2	74	20.4		19	39.0	-2.1	62	1.5		16	34.5	-3.0	49	47.3		12	33.5	-3.7
40	116	6.3		22	26.3		103	54.2		22	35.7		91	32.8		21	39.3		79	10.1		19	36.8		66	51.2		16	31.6		54	37.1		12	29.8	
11 0	120	56.3	289.9	22	26.9		108	44.0	289.7	22	35.4		96	22.5	289.7	21	38.0		83	59.8	289.7	19	34.7		71	41.0	289.8	16	28.6		59	27.0	289.8	12	26.1	
20	125	46.2		22	27.4	0.5	113	33.7		22	35.1	-0.4	101	12.2		21	36.8	-1.3	88	49.5		19	32.5	-2.2	76	30.8		16	25.6	-3.0	64	16.8		12	22.4	-3.7
40	130	36.1		22	28.0		118	23.5		22	34.7		106	1.9		21	35.5		93	39.2		19	30.3		81	20.6		16	22.6		69	6.6		12	18.6	
12 0	135	26.1	289.9	22	28.5		123	13.2	289.7	22	34.3		110	51.5	289.7	21	34.2		98	28.9	289.7	19	28.2		86	10.3	289.8	16	19.5		73	56.4	289.8	12	14.9	
20	140	16.0		22	29.0	0.5	128	2.9		22	33.9	-0.4	115	41.2		21	32.9	-1.3	103	18.6		19	26.0	-2.2	91	0.1		16	16.5	-3.0	78	46.3		12	11.1	-3.8
40	145	5.9		22	29.6		132	52.7		22	33.6		120	30.9		21	31.6		108	8.3		19	23.7		95	49.9		16	13.5		83	36.1		12	7.4	
13 0	149	55.8	289.9	22	30.1		137	42.4	289.7	22	33.2		125	20.6	289.7	21	30.3		112	58.1	289.7	19	21.5		100	39.7	289.8	16	10.4		88	25.9	289.8	12	3.6	
20	154	45.7		22	30.5	0.5	142	32.2		22	32.7	-0.4	130	10.3		21	28.9	-1.4	117	47.8		19	19.3	-2.2	105	29.5		16	7.3	-3.1	93	15.8		11	59.8	-3.8
40	159	35.6		22	31.0		147	21.9		22	32.3		134	59.9		21	27.6		122	37.5		19	17.0		110	19.2		16	4.3		98	5.6		11	56.0	
14 0	164	25.5	289.9	22	31.5		152	11.6	289.7	22	31.9		139	49.6	289.7	21	26.2		127	27.2	289.7	19	14.8		115	9.0	289.8	16	1.2		102	55.4	289.8	11	52.2	
20	169	15.4		22	31.9	0.4	157	1.3		22	31.4	-0.5	144	39.3		21	24.8	-1.4	132	16.9		19	12.5	-2.3	119	58.8		15	58.1	-3.1	107	45.2		11	48.4	-3.8
40	174	5.3		22	32.4		161	51.1		22	30.9		149	29.0		21	23.4		137	6.6		19	10.2		124	48.6		15	55.0		112	35.1		11	44.6	
15 0	178	55.2	289.9	22	32.8		166	40.8	289.7	22	30.5		154	18.6	289.7	21	22.0		141	56.3	289.7	19	7.9		129	38.4	289.8	15	51.8		117	24.9	289.8	11	40.8	
20	183	45.1		22	33.2	0.4	171	30.5		22	30.0	-0.5	159	8.3		21	20.6	-1.4	146	46.0		19	5.6	-2.3	134	28.2		15	48.7	-3.1	122	14.7		11	37.0	-3.8
40	188	35.0		22	33.6		176	20.3		22	29.4		163	58.0		21	19.2		151	35.8		19	3.3		139	18.0		15	45.6		127	4.5		11	33.1	
16 0	193	24.9	289.9	22	34.0		181	10.0	289.7	22	28.9		168	47.7	289.7	21	17.7		156	25.5	289.7	19	0.9		144	7.8	289.8	15	42.4		131	54.4	289.8	11	29.3	
20	198	14.8		22	34.3	0.4	185	59.7		22	28.4	-0.5	173	37.3		21	16.3	-1.5	161	15.2		18	58.6	-2.4	148	57.5		15	39.3	-3.2	136	44.2		11	25.4	-3.9
40	203	4.6		22	34.7		190	49.4		22	27.8		178	27.0		21	14.8		166	4.9		18	56.2		153	47.3		15	36.1		141	34.0		11	21.6	
17 0	207	54.5	289.9	22	35.1		195	39.1	289.7	22	27.3		183	16.7	289.7	21	13.3		170	54.6	289.7	18	53.8		158	37.1	289.8	15	32.9		146	23.9	289.8	11	17.7	
20	212	44.4		22	35.4	0.3	200	28.9		22	26.7	-0.6	188	6.4		21	11.8	-1.5	175	44.4		18	51.5	-2.4	163	26.9		15	29.7	-3.2	151	13.7		11	13.8	-3.9
40	217	34.3		22	35.7		205	18.6		22	26.1		192	56.0		21	10.3		180	34.1		18	49.1		168	16.7		15	26.5		156	3.5		11	9.9	
18 0	222	24.1	289.9	22	36.0		210	8.3	289.7	22	25.5		197	45.7	289.7	21	8.8		185	23.8	289.7	18	46.7		173	6.5	289.8	15	23.3		160	53.3	289.8	11	6.0	
20	227	14.0		22	36.3	0.3	214	58.0		22	24.9	-0.6	202	35.4		21	7.3	-1.5	190	13.5		18	44.2	-2.4	177	56.3		15	20.1	-3.2	165	43.2		11	2.1	-3.9
40	232	3.9		22	36.6		219	47.7		22	24.3		207	25.1		21	5.7		195	3.2		18	41.8		182	46.1		15	16.8		170	33.0		10	58.2	
19 0	236	53.7	289.9	22	36.9		224	37.4	289.7	22	23.7		212	14.8	289.7	21	4.2		199	53.0	289.7	18	39.4		187	35.9	289.8	15	13.6		175	22.8	289.8	10	54.3	
20	241	43.6		22	37.2	0.3	229	27.1		22	23.0	-0.7	217	4.4		21	2.6	-1.6	204	42.7		18	36.9	-2.5	192	25.7		15	10.3	-3.3	180	12.6		10	50.4	-3.9
40	246	33.4		22	37.4		234	16.8		22	22.4		221	54.1		21	1.0		209	32.4		18	34.5		197	15.5		15	7.1		185	2.5		10	46.4	
20 0	251	23.3	289.8	22	37.7		239	6.5	289.7	22	21.7		226	43.8	289.7	20	59.4		214	22.2	289.7	18	32.0		202	5.3	289.8	15	3.8		189	52.3	289.8	10	42.5	
20	256	13.1		22	37.9	0.2	243	56.3		22	21.0	-0.7	231	33.5		20	57.8	-1.6	219	11.9		18	29.5	-2.5	206	55.1		15	0.5	-3.3	194	42.1		10	38.5	-4.0
40	261	3.0		22	38.1		248	46.0		22	20.3		236	23.1		20	56.2		224	1.6		18	27.0		211	44.9		14	57.2		199	31.9		10	34.5	
21 0	265	52.8	289.8	22	38.3		253	35.7	289.7	22	19.6		241	12.8	289.7	20	54.5		228	51.3	289.7	18	24.5		216	34.7	289.8	14	53.9		204	21.8	289.8	10	30.6	
20	270	42.7		22	38.5	0.2	258	25.4		22	18.9	-0.7	246	2.5		20	52.9	-1.6	233	41.1		18	21.9	-2.5	221	24.5		14	50.6	-3.3	209	11.6		10	26.6	-4.0
40	275	32.5		22	38.7		263	15.1		22	18.1		250	52.2		20	51.2		238	30.8		18	19.4		226	14.3		14	47.3		214	1.4		10	22.6	
22 0	280	22.3	289.8	22	38.8		268	4.8	289.7	22	17.4		255	41.9	289.7	20	49.6		243	20.6	289.7	18	16.9		231	4.1	289.8	14	43.9		218	51.2	289.8	10	18.6	
20	285	12.2		22	39.0	0.1	272	54.5		22	16.6	-0.8	260	31.5		20	47.9	-1.7	248	10.3		18	14.3	-2.6	235	53.9		14	40.6	-3.4	223	41.1		10	14.6	-4.0
40	290	2.0		22	39.1		277	44.2		22	15.8		265	21.2		20	46.2		253	0.0		18	11.7		240	43.7		14	37.2		228	30.9		10	10.6	
23 0	294	51.8	289.8	22	39.2		282	33.9	289.7	22	15.0		270	10.9	289.7	20	44.5		257	49.8	289.7	18	9.1		245	33.5	289.8	14	33.8		233	20.7	289.8	10	6.6	
20	299	41.6		22	39.4	0.1	287	23.6		22	14.2	-0.8	275	0.6		20	42.8	-1.7	262	39.5		18	6.6	-2.6	250	23.3		14	30.5	-3.4	238	10.5		10	2.5	-4.0
40	304	31.5		22	39.5		292	13.3		22	13.4		279	50.3		20	41.0		267	29.2		18	3.9		255	13.1		14	27.1		243	0.3		9	58.5	

2011 Moon

	22 Oct						23 Oct						24 Oct						25 Oct						26 Oct						27 Oct					
	GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec		
h m	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'
0 0	247	50.2	289.8	9	54.5	-4.1	235	34.5	289.7	4	45.1	-4.5	223	6.4	289.5	-0	49.2	-4.7	210	15.1	289.1	-6	28.9	-4.7	196	50.7	288.6	-11	50.8	-4.2	182	48.6	288.0	-16	29.0	-3.4
20	252	40.0		9	50.4		240	24.2		4	40.6		227	55.9		-0	53.9		215	4.1		-6	33.6		201	39.2		-11	55.0		187	36.6		-16	32.5	
40	257	29.8		9	46.3		245	13.9		4	36.1		232	45.4		-0	58.6		219	53.2		-6	38.2		206	27.8		-11	59.2		192	24.7		-16	35.9	
1 0	262	19.6	289.8	9	42.3	-4.1	250	3.6	289.7	4	31.6	-4.5	237	34.8	289.5	-1	3.4	-4.7	224	42.2	289.0	-6	42.9	-4.6	211	16.4	288.5	-12	3.4	-4.2	197	12.7	288.0	-16	39.3	-3.4
20	267	9.4		9	38.2		254	53.3		4	27.0		242	24.3		-1	8.1		229	31.3		-6	47.5		216	4.9		-12	7.6		202	0.7		-16	42.7	
40	271	59.3		9	34.1		259	43.0		4	22.5		247	13.7		-1	12.8		234	20.4		-6	52.2		220	53.4		-12	11.8		206	48.8		-16	46.1	
2 0	276	49.1	289.8	9	30.0	-4.1	264	32.8	289.7	4	18.0	-4.6	252	3.2	289.4	-1	17.6	-4.7	239	9.4	289.0	-6	56.8	-4.6	225	42.0	288.5	-12	16.0	-4.2	211	36.8	288.0	-16	49.5	-3.3
20	281	38.9		9	25.9		269	22.5		4	13.4		256	52.6		-1	22.3		243	58.4		-7	1.4		230	30.5		-12	20.2		216	24.8		-16	52.8	
40	286	28.7		9	21.8		274	12.2		4	8.9		261	42.1		-1	27.0		248	47.5		-7	6.0		235	19.0		-12	24.3		221	12.8		-16	56.2	
3 0	291	18.5	289.8	9	17.7	-4.1	279	1.9	289.7	4	4.3	-4.5	266	31.5	289.4	-1	31.8	-4.7	253	36.5	289.0	-7	10.7	-4.6	240	7.5	288.5	-12	28.5	-4.1	226	0.8	288.0	-16	59.5	-3.3
20	296	8.4		9	13.6		283	51.6		3	59.8		271	20.9		-1	36.5		258	25.5		-7	15.3		244	56.0		-12	32.6		230	48.8		-17	2.8	
40	300	58.2		9	9.5		288	41.3		3	55.2		276	10.3		-1	41.3		263	14.5		-7	19.9		249	44.5		-12	36.8		235	36.7		-17	6.1	
4 0	305	48.0	289.8	9	5.3	-4.1	293	30.9	289.7	3	50.7	-4.6	280	59.8	289.4	-1	46.0	-4.7	268	3.5	289.0	-7	24.5	-4.6	254	33.0	288.5	-12	40.9	-4.1	240	24.7	288.0	-17	9.4	-3.3
20	310	37.8		9	1.2		298	20.6		3	46.1		285	49.2		-1	50.7		272	52.5		-7	29.1		259	21.4		-12	45.0		245	12.7		-17	12.7	
40	315	27.6		8	57.0		303	10.3		3	41.5		290	38.6		-1	55.5		277	41.5		-7	33.7		264	9.9		-12	49.1		250	0.7		-17	15.9	
5 0	320	17.4	289.8	8	52.9	-4.2	308	0.0	289.7	3	36.9	-4.6	295	28.0	289.4	-2	0.2	-4.7	282	30.5	289.0	-7	38.3	-4.6	268	58.4	288.4	-12	53.2	-4.1	254	48.6	287.9	-17	19.2	-3.2
20	325	7.2		8	48.7		312	49.7		3	32.4		300	17.4		-2	5.0		287	19.4		-7	42.9		273	46.8		-12	57.3		259	36.6		-17	22.4	
40	329	57.0		8	44.5		317	39.4		3	27.8		305	6.8		-2	9.7		292	8.4		-7	47.5		278	35.3		-13	1.4		264	24.5		-17	25.6	
6 0	334	46.8	289.8	8	40.4	-4.2	322	29.0	289.7	3	23.2	-4.6	309	56.2	289.4	-2	14.4	-4.8	296	57.4	288.9	-7	52.1	-4.6	283	23.7	288.4	-13	5.4	-4.1	269	12.5	287.9	-17	28.8	-3.2
20	339	36.6		8	36.2		327	18.7		3	18.6		314	45.6		-2	19.2		301	46.3		-7	56.6		288	12.1		-13	9.5		274	0.4		-17	32.0	
40	344	26.5		8	32.0		332	8.4		3	14.0		319	34.9		-2	23.9		306	35.3		-8	1.2		293	0.6		-13	13.6		278	48.3		-17	35.2	
7 0	349	16.3	289.8	8	27.8	-4.2	336	58.0	289.7	3	9.4	-4.6	324	24.3	289.4	-2	28.7	-4.7	311	24.2	288.9	-8	5.8	-4.6	297	49.0	288.4	-13	17.6	-4.0	283	36.2	287.9	-17	38.4	-3.1
20	354	6.1		8	23.6		341	47.7		3	4.8		329	13.7		-2	33.4		316	13.1		-8	10.3		302	37.4		-13	21.6		288	24.1		-17	41.5	
40	358	55.9		8	19.4		346	37.4		3	0.2		334	3.1		-2	38.2		321	2.1		-8	14.9		307	25.8		-13	25.6		293	12.1		-17	44.6	
8 0	3	45.7	289.8	8	15.1	-4.2	351	27.0	289.7	2	55.6	-4.6	338	52.4	289.4	-2	42.9	-4.7	325	51.0	288.9	-8	19.5	-4.5	312	14.2	288.4	-13	29.7	-4.0	297	60.0	287.9	-17	47.8	-3.1
20	8	35.5		8	10.9		356	16.7		2	51.0		343	41.8		-2	47.6		330	39.9		-8	24.0		317	2.6		-13	33.7		302	47.9		-17	50.9	
40	13	25.3		8	6.7		1	6.3		2	46.4		348	31.1		-2	52.4		335	28.8		-8	28.6		321	50.9		-13	37.6		307	35.7		-17	53.9	
9 0	18	15.1	289.8	8	2.4	-4.2	5	56.0	289.6	2	41.7	-4.6	353	20.5	289.3	-2	57.1	-4.7	340	17.7	288.9	-8	33.1	-4.5	326	39.3	288.4	-13	41.6	-4.0	312	23.6	287.9	-17	57.0	-3.0
20	23	4.9		7	58.2		10	45.6		2	37.1		358	9.8		-3	1.9		345	6.6		-8	37.6		331	27.7		-13	45.6		317	11.5		-18	0.1	
40	27	54.7		7	53.9		15	35.3		2	32.5		2	59.1		-3	6.6		349	55.5		-8	42.1		336	16.0		-13	49.6		321	59.4		-18	3.1	
10 0	32	44.5	289.8	7	49.7	-4.3	20	24.9	289.6	2	27.8	-4.6	7	48.5	289.3	-3	11.3	-4.7	354	44.3	288.9	-8	46.7	-4.5	341	4.4	288.3	-13	53.5	-3.9	326	47.3	287.9	-18	6.1	-3.0
20	37	34.3		7	45.4		25	14.5		2	23.2		12	37.8		-3	16.1		359	33.2		-8	51.2		345	52.7		-13	57.4		331	35.1		-18	9.2	
40	42	24.1		7	41.1		30	4.2		2	18.6		17	27.1		-3	20.8		4	22.1		-8	55.7		350	41.1		-14	1.4		336	23.0		-18	12.2	
11 0	47	13.8	289.8	7	36.8	-4.3	34	53.8	289.6	2	13.9	-4.6	22	16.4	289.3	-3	25.5	-4.7	9	10.9	288.8	-9	0.2	-4.5	355	29.4	288.3	-14	5.3	-3.9	341	10.8	287.8	-18	15.1	-3.0
20	52	3.6		7	32.5		39	43.4		2	9.3		27	5.7		-3	30.3		13	59.8		-9	4.7		0	17.7		-14	9.2		345	58.7		-18	18.1	
40	56	53.4		7	28.2		44	33.0		2	4.6		31	55.0		-3	35.0		18	48.6		-9	9.2		5	6.0		-14	13.1		350	46.5		-18	21.1	
12 0	61	43.2	289.8	7	23.9	-4.3	49	22.7	289.6	2	0.0	-4.7	36	44.3	289.3	-3	39.7	-4.7	23	37.5	288.8	-9	13.7	-4.5	9	54.3	288.3	-14	17.0	-3.9	355	34.4	287.8	-18	24.0	-2.9
20	66	33.0		7	19.6		54	12.3		1	55.3		41	33.6		-3	44.5		28	26.3		-9	18.2		14	42.6		-14	20.8		0	22.2		-18	26.9	
40	71	22.8		7	15.3		59	1.9		1	50.7		46	22.9		-3	49.2		33	15.1		-9	22.6		19	30.9		-14	24.7		5	10.0		-18	29.8	
13 0	76	12.6	289.8	7	11.0	-4.3	63	51.5	289.6	1	46.0	-4.7	51	12.2	289.3	-3	53.9	-4.7	38	3.9	288.8	-9	27.1	-4.5	24	19.2	288.3	-14	28.6	-3.8	9	57.8	287.8	-18	32.7	-2.9
20	81	2.4		7	6.7		68	41.1		1	41.3		56	1.4		-3	58.7		42	52.7		-9	31.6		29	7.5		-14	32.4		14	45.6		-18	35.6	
40	85	52.1		7	2.3		73	30.7		1	36.7		60	50.7		-4	3.4		47	41.5		-9	36.0		33	55.7		-14	36.2		19	33.5		-18	38.5	
14 0	90	41.9	289.8	6	58.0	-4.4	78	20.3	289.6	1	32.0	-4.7	65	40.0	289.3	-4	8.1	-4.7	52	30.3	288.8	-9	40.5	-4.4	38	44.0	288.2	-14	40.0	-3.8	24	21.3	287.8	-18	41.3	-2.8
20	95	31.7		6	53.7		83	9.9		1	27.3		70	29.2		-4	12.8		57	19.1		-9	44.9		43	32.3		-14	43.9		29	9.1		-18	44.2	
40	100	21.5		6	49.3		87	59.5		1	22.6		75	18.5		-4	17.6		62	7.9		-9	49.4		48	20.5		-14	47.6		33	56.9		-18	47.0	
15 0	105	11.2	289.8	6	44.9	-4.4	92	49.1	289.6	1	18.0	-4.7	80	7.7	289.2	-4	22.3	-4.7	66	56.6	288.8	-9	53.8	-4.4	53	8.8	288.2	-14	51.4	-3.8	38	44.6	287.8	-18	49.8	-2.8
20	110	1.0		6	40.6		97	38.7		1	13.3		84	57.0		-4	27.0		71	45.4		-9	58.2		57	57.0		-14	55.2		43	32.4		-18	52.6	
40	114	50.8		6	36.2		102	28.2		1	8.6		89	46.2		-4	31.7		76	34.2		-10	2.7		62	45.2		-14	59.0		48	20.2		-18	55.3	
16 0	119	40.6	289.8	6	31.8	-4.4	107	17.8	289.6	1	3.9	-4.7	94	35.4	289.2	-4	36.4	-4.7	81	22.9	288.7	-10	7.1	-4.4	67	33.4	288.2	-15	2.7	-3.7	53	8.0	287.8	-18	58.1	-2.7
20	124	30.3		6	27.4		112	7.4		0	59.2		99	24.6		-4	41.2		86	11.7		-10	11.5		72	21.6		-15	6.4		57	55.8		-19	0.8	
40	129	20.1		6	23.1		116	56.9		0	54.5		104	13.9		-4	45.9		91	0.4		-10	15.9		77	9.8		-15	10.2		62	43.5		-19	3.5	
17 0	134	9.9	289.8	6	18.7	-4.4	121	46.5	289.6	0	49.8	-4.7	109	3.1	289.2	-4	50.6	-4.7	95	49.1	288.7	-10	20.3	-4.4	81	58.0	288.2	-15	13.9	-3.7	67	31.3	287.8	-19	6.3	-2.7
20	138	59.6		6	14.3		126	36.1		0	45.2		113	52.3		-4	55.3		100	37.8		-10	24.6		86	46.2		-15	17.6		72	19.0		-19	8.9	
40	143	49.4		6	9.9		131	25.6		0	40.5		118	41.5		-5	0.0		105	26.5		-10	29.0		91	34.4		-15	21.3		77	6.8		-19	11.6	
18 0	148	39.1	289.8	6	5.4	-4.4	136	15.2	289.5	0	35.8	-4.7	123	30.7	289.2	-5	4.7	-4.7	110	15.3	288.7	-10	33.4	-4.4	96	22.6	288.2	-15	25.0	-3.6	81	54.5	287.7	-19	14.3	-2.6
20	153	28.9		6	1.0		141	4.7		0	31.1		128	19.8		-5	9.4		115	3.9		-10	37.8		101	10.8		-15	28.6		86	42.3		-19	16.9	
40	158	18.7		5	56.6		145	54.3		0	26.3		133	9.0		-5	14.1		119	52.6		-10	42.1		105	58.9		-15	32.3		91	30.0		-19	19.5	
19 0	163	8.4	289.7	5	52.2	-4.4	150	43.8	289.5	0	21.6	-4.7	137	58.2	289.2	-5	18.8	-4.7	124	41.3	288.7	-10	46.5	-4.3	110	47.1	288.1	-15	35.9	-3.6	96	17.8	287.7	-19	22.2	-2.6
20	167	58.2		5	47.7		155	33.4		0	16.9		142	47.4		-5	23.5		129	30.0		-10	50.8		115	35.2		-15	39.5		101	5.5		-19	24.7	
40	172	47.9		5	43.3		160	22.9		0	12.2		147	36.5		-5	28.2		134	18.7		-10	55.1		120	23.4		-15	43.2		105	53.2		-19	27.3	
20 0	177	37.7	289.7	5	38.9	-4.5	165	12.4	289.5	0	7.5	-4.7	152	25.7	289.1	-5	32.9	-4.7	139	7.3	288.6	-10	59.5	-4.3	125	11.5	288.1	-15	46.8	-3.6	110	40.9	287.7	-19	29.9	-2.5
20	182	27.4		5	34.4		170	1.9		0	2.8		157	14.8		-5	37.6		143	56.0		-11	3.8		129	59.6		-15	50.4		115	28.6		-19	32.4	
40	187	17.2		5	30.0		174	51.5		-0	1.9		162	4.0		-5	42.2		148	44.6		-11	8.1		134	47.8		-15	53.9		120	16.4		-19	35.0	
21 0	192	6.9	289.7	5	25.5	-4.5	179	41.0	289.5	-0	6.6	-4.7	166	53.1	289.1	-5	46.9	-4.7	153	33.3	288.6	-11	12.4	-4.3	139	35.9	288.1	-15	57.5	-3.5	125	4.1	287.7	-19	37.5	-2.5
20	196	56.6		5	21.0		184	30.5		-0	11.4		171	42.2		-5	51.6		158	21.9		-11	16.7		144	24.0		-16	1.1		129	51.8		-19	40.0	
40	201	46.4		5	16.6		189	20.0		-0	16.1		176	31.4		-5	56.3		163	10.5		-11	21.0		149	12.1		-16	4.6		134	39.5		-19	42.5	
22 0	206	36.1	289.7	5	12.1	-4.5	194	9.5	289.5	-0	20.8	-4.7	181	20.5	289.1	-6	1.0	-4.7	167	59.1	288.6	-11	25.3	-4.3	154	0.2	288.1	-16	8.1	-3.5	139	27.2	287.7	-19	44.9	-2.4
20	211	25.8		5	7.6		198	59.0		-0	25.5		186	9.6		-6	5.6		172	47.7		-11	29.5		158	48.3		-16	11.6		144	14.9		-19	47.4	
40	216	15.6		5	3.1		203	48.5		-0	30.3		190	58.7		-6	10.3		177	36.3		-11	33.8		163	36.3		-16	15.2		149	2.6		-19	49.8	
23 0	221	5.3	289.7	4	58.6	-4.5	208	38.0	289.5	-0	35.0	-4.7	195	47.8	289.1	-6	15.0	-4.6	182	24.9	288.6	-11	38.1	-4.2	168	24.4	288.1	-16	18.6	-3.5	153	50.2	287.7	-19	52.2	-2.4
20	225	55.0		4	54.1		213	27.5		-0	39.7		200	36.9		-6	19.6		187	13.5		-11	42.3		173	12.5		-16	22.1		158	37.9		-19	54.6	
40	230	44.8		4	49.6		218	16.9		-0	44.4		205	26.0		-6	24.3		192	2.1		-11	46.6		178	0.5		-16	25.6		163	25.6		-19	57.0	

2011 Moon

h m	28 Oct GHA ° '	d	Dec ° '	d '	29 Oct GHA ° '	d	Dec ° '	d '	30 Oct GHA ° '	d	Dec ° '	d '	31 Oct GHA ° '	d	Dec ° '	d '	1 Nov GHA ° '	d	Dec ° '	d '	2 Nov GHA ° '	d	Dec ° '	d '
0 0	168 13.3	287.7	-19 59.3	-2.3	153 20.7	287.6	-22 3.8	-1.1	138 35.4	287.9	-22 35.3	0.2	124 22.6	288.5	-21 38.2	1.4	110 59.8	289.3	-19 25.9	2.3	98 32.8	290.0	-16 15.7	3.0
20	173 0.9		-20 1.7		158 8.3		-22 4.9		143 23.3		-22 35.0		129 11.1		-21 36.8		115 49.0		-19 23.7		103 22.8		-16 12.8	
40	177 48.6		-20 4.0		162 55.9		-22 6.0		148 11.2		-22 34.8		133 59.6		-21 35.4		120 38.3		-19 21.4		108 12.8		-16 9.8	
1 0	182 36.3	287.7	-20 6.3	-2.3	167 43.5	287.6	-22 7.0	-1.0	152 59.1	287.9	-22 34.6	0.3	138 48.1	288.5	-21 34.1	1.4	125 27.5	289.3	-19 19.0	2.3	113 2.8	290.0	-16 6.8	3.0
20	187 23.9		-20 8.6		172 31.1		-22 8.0		157 47.0		-22 34.3		143 36.6		-21 32.7		130 16.8		-19 16.7		117 52.9		-16 3.8	
40	192 11.6		-20 10.9		177 18.7		-22 9.0		162 34.9		-22 34.0		148 25.1		-21 31.2		135 6.1		-19 14.4		122 42.9		-16 0.8	
2 0	196 59.3	287.6	-20 13.2	-2.2	182 6.3	287.6	-22 10.0	-1.0	167 22.8	287.9	-22 33.7	0.3	153 13.7	288.5	-21 29.8	1.5	139 55.4	289.3	-19 12.1	2.4	127 33.0	290.1	-15 57.8	3.0
20	201 46.9		-20 15.4		186 53.9		-22 11.0		172 10.7		-22 33.4		158 2.2		-21 28.4		144 44.7		-19 9.7		132 23.0		-15 54.8	
40	206 34.6		-20 17.7		191 41.5		-22 11.9		176 58.6		-22 33.1		162 50.7		-21 26.9		149 34.0		-19 7.3		137 13.1		-15 51.8	
3 0	211 22.2	287.6	-20 19.9	-2.2	196 29.1	287.6	-22 12.9	-0.9	181 46.6	287.9	-22 32.8	0.4	167 39.3	288.6	-21 25.4	1.5	154 23.3	289.4	-19 5.0	2.4	142 3.2	290.1	-15 48.7	3.0
20	216 9.8		-20 22.1		201 16.7		-22 13.8		186 34.5		-22 32.4		172 27.9		-21 23.9		159 12.7		-19 2.6		146 53.3		-15 45.7	
40	220 57.5		-20 24.2		206 4.3		-22 14.7		191 22.5		-22 32.0		177 16.5		-21 22.4		164 2.0		-19 0.2		151 43.4		-15 42.7	
4 0	225 45.1	287.6	-20 26.4	-2.1	210 51.9	287.6	-22 15.5	-0.9	196 10.4	288.0	-22 31.6	0.4	182 5.0	288.6	-21 20.9	1.5	168 51.4	289.4	-18 57.8	2.4	156 33.5	290.1	-15 39.6	3.1
20	230 32.8		-20 28.5		215 39.5		-22 16.4		200 58.4		-22 31.2		186 53.6		-21 19.4		173 40.8		-18 55.4		161 23.7		-15 36.5	
40	235 20.4		-20 30.7		220 27.1		-22 17.2		205 46.3		-22 30.8		191 42.3		-21 17.8		178 30.1		-18 52.9		166 13.8		-15 33.5	
5 0	240 8.0	287.6	-20 32.8	-2.1	225 14.8	287.6	-22 18.1	-0.8	210 34.3	288.0	-22 30.3	0.5	196 30.9	288.6	-21 16.3	1.6	183 19.5	289.4	-18 50.5	2.5	171 4.0	290.2	-15 30.4	3.1
20	244 55.6		-20 34.9		230 2.4		-22 18.9		215 22.3		-22 29.9		201 19.5		-21 14.7		188 8.9		-18 48.1		175 54.1		-15 27.3	
40	249 43.3		-20 36.9		234 50.0		-22 19.6		220 10.3		-22 29.4		206 8.2		-21 13.1		192 58.4		-18 45.6		180 44.3		-15 24.2	
6 0	254 30.9	287.6	-20 39.0	-2.0	239 37.6	287.6	-22 20.4	-0.7	224 58.3	288.0	-22 28.9	0.5	210 56.8	288.7	-21 11.5	1.6	197 47.8	289.4	-18 43.1	2.5	185 34.5	290.2	-15 21.1	3.1
20	259 18.5		-20 41.0		244 25.3		-22 21.2		229 46.3		-22 28.4		215 45.5		-21 9.9		202 37.2		-18 40.6		190 24.6		-15 18.0	
40	264 6.1		-20 43.1		249 12.9		-22 21.9		234 34.3		-22 27.8		220 34.1		-21 8.3		207 26.7		-18 38.2		195 14.8		-15 14.9	
7 0	268 53.7	287.6	-20 45.1	-2.0	254 0.5	287.6	-22 22.6	-0.7	239 22.3	288.0	-22 27.3	0.6	225 22.8	288.7	-21 6.6	1.7	212 16.1	289.5	-18 35.7	2.5	200 5.1	290.2	-15 11.8	3.1
20	273 41.3		-20 47.1		258 48.2		-22 23.3		244 10.4		-22 26.7		230 11.5		-21 5.0		217 5.6		-18 33.1		204 55.3		-15 8.7	
40	278 29.0		-20 49.0		263 35.8		-22 24.0		248 58.4		-22 26.1		235 0.2		-21 3.3		221 55.1		-18 30.6		209 45.5		-15 5.6	
8 0	283 16.6	287.6	-20 51.0	-1.9	268 23.5	287.7	-22 24.6	-0.6	253 46.5	288.1	-22 25.5	0.6	239 48.9	288.7	-21 1.6	1.7	226 44.6	289.5	-18 28.1	2.5	214 35.7	290.3	-15 2.4	3.1
20	288 4.2		-20 52.9		273 11.1		-22 25.3		258 34.5		-22 24.9		244 37.7		-20 59.9		231 34.1		-18 25.6		219 26.0		-14 59.3	
40	292 51.8		-20 54.8		277 58.8		-22 25.9		263 22.6		-22 24.3		249 26.4		-20 58.2		236 23.6		-18 23.0		224 16.2		-14 56.1	
9 0	297 39.4	287.6	-20 56.7	-1.9	282 46.4	287.7	-22 26.5	-0.6	268 10.6	288.1	-22 23.6	0.7	254 15.1	288.8	-20 56.5	1.7	241 13.1	289.5	-18 20.5	2.6	229 6.5	290.3	-14 53.0	3.2
20	302 27.0		-20 58.6		287 34.1		-22 27.1		272 58.7		-22 23.0		259 3.9		-20 54.8		246 2.6		-18 17.9		233 56.8		-14 49.8	
40	307 14.6		-21 0.5		292 21.7		-22 27.7		277 46.8		-22 22.3		263 52.7		-20 53.0		250 52.2		-18 15.3		238 47.1		-14 46.6	
10 0	312 2.2	287.6	-21 2.3	-1.8	297 9.4	287.7	-22 28.2	-0.5	282 34.9	288.1	-22 21.6	0.7	268 41.4	288.8	-20 51.3	1.8	255 41.8	289.6	-18 12.7	2.6	243 37.4	290.3	-14 43.5	3.2
20	316 49.8		-21 4.2		301 57.1		-22 28.7		287 23.0		-22 20.9		273 30.2		-20 49.5		260 31.3		-18 10.1		248 27.7		-14 40.3	
40	321 37.4		-21 6.0		306 44.7		-22 29.3		292 11.1		-22 20.2		278 19.0		-20 47.7		265 20.9		-18 7.5		253 18.0		-14 37.1	
11 0	326 25.0	287.6	-21 7.8	-1.8	311 32.4	287.7	-22 29.8	-0.4	296 59.2	288.1	-22 19.4	0.8	283 7.8	288.8	-20 45.9	1.8	270 10.5	289.6	-18 4.9	2.6	258 8.3	290.3	-14 33.9	3.2
20	331 12.5		-21 9.5		316 20.1		-22 30.2		301 47.3		-22 18.7		287 56.6		-20 44.1		275 0.1		-18 2.3		262 58.6		-14 30.7	
40	336 0.1		-21 11.3		321 7.8		-22 30.7		306 35.5		-22 17.9		292 45.5		-20 42.3		279 49.7		-17 59.6		267 49.0		-14 27.5	
12 0	340 47.7	287.6	-21 13.1	-1.7	325 55.5	287.7	-22 31.1	-0.4	311 23.6	288.2	-22 17.1	0.8	297 34.3	288.9	-20 40.4	1.9	284 39.3	289.6	-17 57.0	2.7	272 39.3	290.4	-14 24.3	3.2
20	345 35.3		-21 14.8		330 43.1		-22 31.6		316 11.8		-22 16.3		302 23.2		-20 38.6		289 29.0		-17 54.3		277 29.7		-14 21.0	
40	350 22.9		-21 16.5		335 30.8		-22 32.0		320 59.9		-22 15.5		307 12.0		-20 36.7		294 18.6		-17 51.7		282 20.0		-14 17.8	
13 0	355 10.5	287.6	-21 18.2	-1.6	340 18.5	287.7	-22 32.4	-0.3	325 48.1	288.2	-22 14.6	0.9	312 0.9	288.9	-20 34.8	1.9	299 8.3	289.7	-17 49.0	2.7	287 10.4	290.4	-14 14.6	3.3
20	359 58.1		-21 19.8		345 6.2		-22 32.7		330 36.3		-22 13.8		316 49.8		-20 32.9		303 57.9		-17 46.3		292 0.8		-14 11.3	
40	4 45.7		-21 21.5		349 54.0		-22 33.1		335 24.4		-22 12.9		321 38.7		-20 31.0		308 47.6		-17 43.6		296 51.2		-14 8.1	
14 0	9 33.2	287.6	-21 23.1	-1.6	354 41.7	287.7	-22 33.4	-0.3	340 12.6	288.2	-22 12.0	0.9	326 27.6	288.9	-20 29.1	1.9	313 37.3	289.7	-17 40.9	2.7	301 41.6	290.4	-14 4.8	3.3
20	14 20.8		-21 24.7		359 29.4		-22 33.7		345 0.8		-22 11.1		331 16.5		-20 27.2		318 27.0		-17 38.2		306 32.0		-14 1.6	
40	19 8.4		-21 26.3		4 17.1		-22 34.0		349 49.0		-22 10.2		336 5.4		-20 25.2		323 16.7		-17 35.5		311 22.4		-13 58.3	
15 0	23 56.0	287.6	-21 27.9	-1.6	9 4.8	287.7	-22 34.3	-0.3	354 37.3	288.2	-22 9.2	1.0	340 54.4	289.0	-20 23.3	2.0	328 6.4	289.7	-17 32.7	2.7	316 12.9	290.4	-13 55.0	3.3
20	28 43.6		-21 29.5		13 52.6		-22 34.6		359 25.5		-22 8.3		345 43.3		-20 21.3		332 56.1		-17 30.0		321 3.3		-13 51.7	
40	33 31.1		-21 31.0		18 40.3		-22 34.8		4 13.7		-22 7.3		350 32.3		-20 19.3		337 45.9		-17 27.2		325 53.8		-13 48.5	
16 0	38 18.7	287.6	-21 32.6	-1.5	23 28.0	287.7	-22 35.1	-0.2	9 2.0	288.3	-22 6.3	1.0	355 21.2	289.0	-20 17.3	2.0	342 35.6	289.8	-17 24.5	2.8	330 44.2	290.5	-13 45.2	3.3
20	43 6.3		-21 34.1		28 15.8		-22 35.3		13 50.2		-22 5.3		0 10.2		-20 15.3		347 25.4		-17 21.7		335 34.7		-13 41.9	
40	47 53.9		-21 35.6		33 3.5		-22 35.5		18 38.5		-22 4.3		4 59.2		-20 13.3		352 15.2		-17 18.9		340 25.2		-13 38.6	
17 0	52 41.5	287.6	-21 37.0	-1.5	37 51.3	287.8	-22 35.6	-0.2	23 26.8	288.3	-22 3.3	1.1	9 48.2	289.0	-20 11.3	2.1	357 4.9	289.8	-17 16.2	2.8	345 15.6	290.5	-13 35.3	3.3
20	57 29.0		-21 38.5		42 39.0		-22 35.8		28 15.0		-22 2.3		14 37.2		-20 9.2		1 54.7		-17 13.4		350 6.1		-13 31.9	
40	62 16.6		-21 39.9		47 26.8		-22 35.9		33 3.3		-22 1.2		19 26.2		-20 7.2		6 44.5		-17 10.6		354 56.6		-13 28.6	
18 0	67 4.2	287.6	-21 41.4	-1.4	52 14.6	287.8	-22 36.1	-0.1	37 51.6	288.3	-22 0.1	1.1	24 15.3	289.1	-20 5.1	2.1	11 34.3	289.8	-17 7.7	2.8	359 47.2	290.5	-13 25.3	3.3
20	71 51.8		-21 42.8		57 2.4		-22 36.2		42 39.9		-21 59.0		29 4.3		-20 3.0		16 24.2		-17 4.9		4 37.7		-13 22.0	
40	76 39.3		-21 44.1		61 50.1		-22 36.2		47 28.3		-21 57.9		33 53.4		-20 1.0		21 14.0		-17 2.1		9 28.2		-13 18.6	
19 0	81 26.9	287.6	-21 45.5	-1.3	66 37.9	287.8	-22 36.3	0.0	52 16.6	288.3	-21 56.8	1.2	38 42.4	289.1	-19 58.9	2.1	26 3.9	289.9	-16 59.3	2.9	14 18.7	290.6	-13 15.3	3.4
20	86 14.5		-21 46.9		71 25.7		-22 36.4		57 4.9		-21 55.7		43 31.5		-19 56.7		30 53.7		-16 56.4		19 9.3		-13 11.9	
40	91 2.1		-21 48.2		76 13.5		-22 36.4		61 53.3		-21 54.5		48 20.6		-19 54.6		35 43.6		-16 53.6		23 59.8		-13 8.6	
20 0	95 49.7	287.6	-21 49.5	-1.3	81 1.3	287.8	-22 36.4	0.0	66 41.6	288.4	-21 53.3	1.2	53 9.7	289.1	-19 52.5	2.2	40 33.4	289.9	-16 50.7	2.9	28 50.4	290.6	-13 5.2	3.4
20	100 37.2		-21 50.8		85 49.1		-22 36.4		71 30.0		-21 52.2		57 58.8		-19 50.3		45 23.3		-16 47.8		33 41.0		-13 1.9	
40	105 24.8		-21 52.1		90 36.9		-22 36.4		76 18.4		-21 51.0		62 47.9		-19 48.2		50 13.2		-16 45.0		38 31.6		-12 58.5	
21 0	110 12.4	287.6	-21 53.3	-1.2	95 24.8	287.8	-22 36.4	0.1	81 6.7	288.4	-21 49.8	1.3	67 37.1	289.2	-19 46.0	2.2	55 3.1	289.9	-16 42.1	2.9	43 22.1	290.6	-12 55.1	3.4
20	114 60.0		-21 54.6		100 12.6		-22 36.3		85 55.1		-21 48.5		72 26.2		-19 43.8		59 53.1		-16 39.2		48 12.7		-12 51.7	
40	119 47.6		-21 55.8		105 0.4		-22 36.2		90 43.5		-21 47.3		77 15.4		-19 41.6		64 43.0		-16 36.3		53 3.3		-12 48.4	
22 0	124 35.2	287.6	-21 57.0	-1.2	109 48.2	287.8	-22 36.1	0.1	95 32.0	288.4	-21 46.0	1.3	82 4.5	289.2	-19 39.4	2.2	69 32.9	290.0	-16 33.4	2.9	57 54.0	290.6	-12 45.0	3.4
20	129 22.7		-21 58.2		114 36.1		-22 36.0		100 20.4		-21 44.8		86 53.7		-19 37.2		74 22.9		-16 30.4		62 44.6		-12 41.6	
40	134 10.3		-21 59.3		119 23.9		-22 35.9		105 8.8		-21 43.5		91 42.9		-19 35.0		79 12.8		-16 27.5		67 35.2		-12 38.2	
23 0	138 57.9	287.6	-22 0.5	-1.1	124 11.8	287.9	-22 35.8	0.2	109 57.2	288.5	-21 42.2	1.3	96 32.1	289.2	-19 32.7	2.3	84 2.8	290.0	-16 24.6	3.0	72 25.9	290.7	-12 34.8	3.4
20	143 45.5		-22 1.6		128 59.7		-22 35.6		114 45.7		-21 40.9		101 21.3		-19 30.5		88 52.8		-16 21.6		77 16.5		-12 31.3	
40	148 33.1		-22 2.7		133 47.5		-22 35.4		119 34.2		-21 39.5		106 10.5		-19 28.2		93 42.8		-16 18.7		82 7.2		-12 27.9	

2011 Moon

	3 Nov						4 Nov						5 Nov						6 Nov						7 Nov						8 Nov					
	GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec		
h m	°	'	d	°	'	d '	°	'	d	°	'	d '	°	'	d	°	'	d '	°	'	d	°	'	d '	°	'	d	°	'	d '	°	'	d	°	'	d '
0 0	86	57.8	290.7	-12	24.5	3.4	76	5.1	291.2	-8	7.0	3.7	65	42.2	291.5	-3	35.3	3.8	55	36.1	291.6	1	0.6	3.8	45	34.4	291.6	5	31.5	3.7	35	25.7	291.4	9	49.0	3.4
20	91	48.5		-12	21.1		80	56.3		-8	3.3		70	33.7		-3	31.4		60	27.8		1	4.4		50	26.0		5	35.2		40	17.2		9	52.4	
40	96	39.2		-12	17.6		85	47.5		-7	59.6		75	25.2		-3	27.6		65	19.4		1	8.2		55	17.6		5	38.9		45	8.6		9	55.9	
1 0	101	29.9	290.7	-12	14.2	3.4	90	38.7	291.2	-7	55.9	3.7	80	16.7	291.5	-3	23.8	3.8	70	11.0	291.6	1	12.0	3.8	60	9.2	291.6	5	42.6	3.7	50	0.1	291.4	9	59.3	3.4
20	106	20.6		-12	10.8		95	29.9		-7	52.2		85	8.2		-3	20.0		75	2.7		1	15.8		65	0.8		5	46.3		54	51.5		10	2.7	
40	111	11.3		-12	7.3		100	21.1		-7	48.4		89	59.7		-3	16.1		79	54.3		1	19.7		69	52.5		5	50.0		59	43.0		10	6.1	
2 0	116	2.0	290.7	-12	3.9	3.5	105	12.3	291.2	-7	44.7	3.7	94	51.3	291.5	-3	12.3	3.8	84	46.0	291.6	1	23.5	3.8	74	44.1	291.6	5	53.6	3.7	64	34.4	291.4	10	9.6	3.4
20	120	52.7		-12	0.4		110	3.5		-7	41.0		99	42.8		-3	8.5		89	37.6		1	27.3		79	35.7		5	57.3		69	25.8		10	13.0	
40	125	43.4		-11	56.9		114	54.7		-7	37.3		104	34.3		-3	4.6		94	29.3		1	31.1		84	27.3		6	1.0		74	17.2		10	16.4	
3 0	130	34.2	290.8	-11	53.5	3.5	119	45.9	291.2	-7	33.6	3.7	109	25.8	291.5	-3	0.8	3.8	99	20.9	291.6	1	34.9	3.8	89	18.9	291.6	6	4.6	3.7	79	8.7	291.4	10	19.8	3.4
20	135	24.9		-11	50.0		124	37.1		-7	29.8		114	17.3		-2	57.0		104	12.6		1	38.7		94	10.5		6	8.3		84	0.1		10	23.2	
40	140	15.7		-11	46.5		129	28.4		-7	26.1		119	8.9		-2	53.2		109	4.2		1	42.5		99	2.1		6	12.0		88	51.5		10	26.6	
4 0	145	6.4	290.8	-11	43.1	3.5	134	19.6	291.2	-7	22.4	3.7	124	0.4	291.5	-2	49.3	3.8	113	55.8	291.6	1	46.3	3.8	103	53.7	291.6	6	15.6	3.7	93	42.9	291.4	10	30.0	3.4
20	149	57.2		-11	39.6		139	10.8		-7	18.7		128	51.9		-2	45.5		118	47.5		1	50.1		108	45.3		6	19.3		98	34.3		10	33.3	
40	154	48.0		-11	36.1		144	2.1		-7	14.9		133	43.5		-2	41.7		123	39.1		1	53.9		113	36.9		6	22.9		103	25.7		10	36.7	
5 0	159	38.8	290.8	-11	32.6	3.5	148	53.3	291.3	-7	11.2	3.7	138	35.0	291.5	-2	37.8	3.8	128	30.8	291.6	1	57.7	3.8	118	28.5	291.6	6	26.6	3.6	108	17.1	291.4	10	40.1	3.4
20	164	29.5		-11	29.1		153	44.6		-7	7.4		143	26.5		-2	34.0		133	22.4		2	1.5		123	20.1		6	30.2		113	8.5		10	43.5	
40	169	20.4		-11	25.6		158	35.9		-7	3.7		148	18.1		-2	30.2		138	14.1		2	5.3		128	11.7		6	33.9		117	59.9		10	46.8	
6 0	174	11.2	290.8	-11	22.1	3.5	163	27.1	291.3	-7	0.0	3.8	153	9.6	291.6	-2	26.3	3.8	143	5.7	291.6	2	9.1	3.8	133	3.3	291.6	6	37.5	3.6	122	51.3	291.4	10	50.2	3.4
20	179	2.0		-11	18.6		168	18.4		-6	56.2		158	1.2		-2	22.5		147	57.4		2	12.9		137	54.9		6	41.2		127	42.7		10	53.6	
40	183	52.8		-11	15.0		173	9.7		-6	52.5		162	52.7		-2	18.7		152	49.0		2	16.7		142	46.5		6	44.8		132	34.1		10	56.9	
7 0	188	43.6	290.8	-11	11.5	3.5	178	1.0	291.3	-6	48.7	3.7	167	44.3	291.6	-2	14.8	3.8	157	40.7	291.7	2	20.5	3.8	147	38.0	291.6	6	48.4	3.6	137	25.5	291.4	11	0.3	3.3
20	193	34.5		-11	8.0		182	52.2		-6	45.0		172	35.8		-2	11.0		162	32.3		2	24.3		152	29.6		6	52.0		142	16.9		11	3.6	
40	198	25.3		-11	4.5		187	43.5		-6	41.2		177	27.4		-2	7.1		167	24.0		2	28.1		157	21.2		6	55.7		147	8.2		11	6.9	
8 0	203	16.2	290.9	-11	0.9	3.5	192	34.8	291.3	-6	37.5	3.8	182	19.0	291.6	-2	3.3	3.8	172	15.6	291.7	2	31.9	3.8	162	12.8	291.6	6	59.3	3.6	151	59.6	291.4	11	10.3	3.3
20	208	7.0		-10	57.4		197	26.1		-6	33.7		187	10.5		-1	59.5		177	7.3		2	35.7		167	4.4		7	2.9		156	51.0		11	13.6	
40	212	57.9		-10	53.9		202	17.4		-6	29.9		192	2.1		-1	55.6		181	58.9		2	39.4		171	55.9		7	6.5		161	42.3		11	16.9	
9 0	217	48.8	290.9	-10	50.3	3.6	207	8.8	291.3	-6	26.2	3.8	196	53.7	291.6	-1	51.8	3.8	186	50.6	291.7	2	43.2	3.8	176	47.5	291.6	7	10.1	3.6	166	33.7	291.4	11	20.2	3.3
20	222	39.6		-10	46.8		212	0.1		-6	22.4		201	45.2		-1	48.0		191	42.2		2	47.0		181	39.1		7	13.7		171	25.0		11	23.5	
40	227	30.5		-10	43.2		216	51.4		-6	18.6		206	36.8		-1	44.1		196	33.9		2	50.8		186	30.6		7	17.4		176	16.4		11	26.9	
10 0	232	21.4	290.9	-10	39.6	3.5	221	42.7	291.3	-6	14.9	3.8	211	28.4	291.6	-1	40.3	3.8	201	25.5	291.6	2	54.6	3.8	191	22.2	291.6	7	21.0	3.6	181	7.7	291.3	11	30.2	3.3
20	237	12.3		-10	36.1		226	34.0		-6	11.1		216	19.9		-1	36.5		206	17.2		2	58.3		196	13.8		7	24.6		185	59.1		11	33.5	
40	242	3.2		-10	32.5		231	25.4		-6	7.3		221	11.5		-1	32.6		211	8.8		3	2.1		201	5.3		7	28.2		190	50.4		11	36.7	
11 0	246	54.2	290.9	-10	29.0	3.6	236	16.7	291.3	-6	3.6	3.8	226	3.1	291.6	-1	28.8	3.8	216	0.5	291.6	3	5.9	3.8	205	56.9	291.6	7	31.7	3.6	195	41.8	291.3	11	40.0	3.3
20	251	45.1		-10	25.4		241	8.1		-5	59.8		230	54.7		-1	25.0		220	52.1		3	9.7		210	48.5		7	35.3		200	33.1		11	43.3	
40	256	36.0		-10	21.8		245	59.4		-5	56.0		235	46.3		-1	21.1		225	43.8		3	13.4		215	40.0		7	38.9		205	24.4		11	46.6	
12 0	261	26.9	291.0	-10	18.2	3.6	250	50.8	291.4	-5	52.2	3.8	240	37.9	291.6	-1	17.3	3.8	230	35.4	291.6	3	17.2	3.8	220	31.6	291.5	7	42.5	3.6	210	15.7	291.3	11	49.9	3.2
20	266	17.9		-10	14.6		255	42.1		-5	48.4		245	29.5		-1	13.4		235	27.1		3	21.0		225	23.1		7	46.1		215	7.1		11	53.1	
40	271	8.8		-10	11.0		260	33.5		-5	44.7		250	21.1		-1	9.6		240	18.7		3	24.7		230	14.7		7	49.7		219	58.4		11	56.4	
13 0	275	59.8	291.0	-10	7.4	3.6	265	24.9	291.4	-5	40.9	3.8	255	12.6	291.6	-1	5.8	3.8	245	10.4	291.6	3	28.5	3.8	235	6.2	291.5	7	53.2	3.6	224	49.7	291.3	11	59.6	3.3
20	280	50.8		-10	3.9		270	16.2		-5	37.1		260	4.2		-1	1.9		250	2.0		3	32.3		239	57.8		7	56.8		229	41.0		12	2.9	
40	285	41.7		-10	0.3		275	7.6		-5	33.3		264	55.8		-0	58.1		254	53.7		3	36.0		244	49.3		8	0.4		234	32.3		12	6.1	
14 0	290	32.7	291.0	-9	56.6	3.6	279	59.0	291.4	-5	29.5	3.8	269	47.4	291.6	-0	54.3	3.8	259	45.3	291.6	3	39.8	3.7	249	40.8	291.5	8	3.9	3.6	239	23.6	291.3	12	9.4	3.2
20	295	23.7		-9	53.0		284	50.4		-5	25.7		274	39.0		-0	50.4		264	37.0		3	43.5		254	32.4		8	7.5		244	14.9		12	12.6	
40	300	14.7		-9	49.4		289	41.8		-5	21.9		279	30.6		-0	46.6		269	28.6		3	47.3		259	23.9		8	11.0		249	6.2		12	15.8	
15 0	305	5.7	291.0	-9	45.8	3.6	294	33.2	291.4	-5	18.1	3.8	284	22.2	291.6	-0	42.8	3.8	274	20.3	291.6	3	51.0	3.8	264	15.4	291.5	8	14.6	3.5	253	57.5	291.3	12	19.1	3.2
20	309	56.7		-9	42.2		299	24.5		-5	14.4		289	13.9		-0	38.9		279	11.9		3	54.8		269	7.0		8	18.1		258	48.8		12	22.3	
40	314	47.7		-9	38.6		304	16.0		-5	10.6		294	5.5		-0	35.1		284	3.6		3	58.5		273	58.5		8	21.7		263	40.0		12	25.5	
16 0	319	38.7	291.0	-9	34.9	3.6	309	7.4	291.4	-5	6.8	3.8	298	57.1	291.6	-0	31.3	3.8	288	55.2	291.6	4	2.3	3.7	278	50.0	291.5	8	25.2	3.5	268	31.3	291.3	12	28.7	3.2
20	324	29.8		-9	31.3		313	58.8		-5	3.0		303	48.7		-0	27.4		293	46.8		4	6.0		283	41.5		8	28.8		273	22.6		12	31.9	
40	329	20.8		-9	27.7		318	50.2		-4	59.2		308	40.3		-0	23.6		298	38.5		4	9.8		288	33.1		8	32.3		278	13.8		12	35.1	
17 0	334	11.8	291.1	-9	24.1	3.7	323	41.6	291.4	-4	55.4	3.8	313	31.9	291.6	-0	19.8	3.8	303	30.1	291.6	4	13.5	3.7	293	24.6	291.5	8	35.8	3.5	283	5.1	291.3	12	38.3	3.2
20	339	2.9		-9	20.4		328	33.0		-4	51.6		318	23.5		-0	15.9		308	21.8		4	17.3		298	16.1		8	39.3		287	56.4		12	41.5	
40	343	53.9		-9	16.8		333	24.4		-4	47.7		323	15.1		-0	12.1		313	13.4		4	21.0		303	7.6		8	42.9		292	47.6		12	44.7	
18 0	348	45.0	291.1	-9	13.1	3.6	338	15.9	291.4	-4	43.9	3.8	328	6.8	291.6	-0	8.3	3.8	318	5.0	291.6	4	24.7	3.7	307	59.1	291.5	8	46.4	3.5	297	38.9	291.2	12	47.8	3.2
20	353	36.1		-9	9.5		343	7.3		-4	40.1		332	58.4		-0	4.4		322	56.7		4	28.5		312	50.6		8	49.9		302	30.1		12	51.0	
40	358	27.1		-9	5.8		347	58.7		-4	36.3		337	50.0		-0	0.6		327	48.3		4	32.2		317	42.1		8	53.4		307	21.3		12	54.2	
19 0	3	18.2	291.1	-9	2.2	3.7	352	50.2	291.4	-4	32.5	3.8	342	41.6	291.6	0	3.2	3.8	332	40.0	291.6	4	35.9	3.7	322	33.6	291.5	8	56.9	3.5	312	12.6	291.2	12	57.3	3.2
20	8	9.3		-8	58.5		357	41.6		-4	28.7		347	33.3		0	7.1		337	31.6		4	39.6		327	25.1		9	0.4		317	3.8		13	0.5	
40	13	0.4		-8	54.9		2	33.1		-4	24.9		352	24.9		0	10.9		342	23.2		4	43.4		332	16.6		9	3.9		321	55.0		13	3.6	
20 0	17	51.5	291.1	-8	51.2	3.7	7	24.5	291.5	-4	21.1	3.8	357	16.5	291.6	0	14.7	3.8	347	14.9	291.6	4	47.1	3.7	337	8.1	291.5	9	7.4	3.5	326	46.3	291.2	13	6.8	3.1
20	22	42.6		-8	47.5		12	16.0		-4	17.3		2	8.1		0	18.5		352	6.5		4	50.8		341	59.6		9	10.9		331	37.5		13	9.9	
40	27	33.7		-8	43.8		17	7.4		-4	13.5		6	59.8		0	22.4		356	58.1		4	54.5		346	51.1		9	14.4		336	28.7		13	13.0	
21 0	32	24.8	291.1	-8	40.2	3.7	21	58.9	291.5	-4	9.6	3.8	11	51.4	291.6	0	26.2	3.8	1	49.8	291.6	4	58.2	3.7	351	42.5	291.5	9	17.8	3.5	341	19.9	291.2	13	16.1	3.1
20	37	15.9		-8	36.5		26	50.4		-4	5.8		16	43.0		0	30.0		6	41.4		5	1.9		356	34.0		9	21.3		346	11.1		13	19.3	
40	42	7.1		-8	32.8		31	41.8		-4	2.0		21	34.7		0	33.8		11	33.0		5	5.7		1	25.5		9	24.8		351	2.3		13	22.4	
22 0	46	58.2	291.1	-8	29.1	3.7	36	33.3	291.5	-3	58.2	3.8	26	26.3	291.6	0	37.7	3.8	16	24.6	291.6	5	9.4	3.7	6	17.0	291.5	9	28.3	3.4	355	53.5	291.2	13	25.5	3.1
20	51	49.3		-8	25.5		41	24.8		-3	54.4		31	17.9		0	41.5		21	16.3		5	13.1		11	8.4		9	31.7		0	44.7		13	28.6	
40	56	40.5		-8	21.8		46	16.3		-3	50.5		36	9.6		0	45.3		26	7.9		5	16.8		15	59.9		9	35.2		5	35.9		13	31.7	
23 0	61	31.6	291.2	-8	18.1	3.7	51	7.8	291.5	-3	46.7	3.8	41	1.2	291.6	0	49.1	3.8	30	59.5	291.6	5	20.5	3.7	20	51.4	291.5	9	38.6	3.5	10	27.1	291.2	13	34.7	3.1
20	66	22.8		-8	14.4		55	59.2		-3	42.9		45	52.8		0	52.9		35	51.1		5	24.2		25	42.8		9	42.1		15	18.2		13	37.8	
40	71	14.0		-8	10.7		60	50.7		-3	39.1		50	44.5		0	56.8		40	42.8		5	27.9		30	34.3		9	45.5		20	9.4		13	40.9	

2011 Moon

	9 Nov					10 Nov					11 Nov					12 Nov					13 Nov					14 Nov				
	GHA			Dec		GHA			Dec		GHA			Dec		GHA			Dec		GHA			Dec		GHA			Dec	
h m	o	'	d	o	'	o	'	d	o	'	o	'	d	o	'	o	'	d	o	'	o	'	d	o	'	o	'	d	o	'
0 0	25	0.6	291.2	13	44.0	14	11.7	290.8	17	7.1	2	55.4	290.4	19	48.5	351	12.1	290.1	21	38.9	339	7.0	289.8	22	30.4	326	49.0	289.7	22	17.7
20	29	51.8		13	47.0	19	2.5		17	9.6	7	45.8		19	50.4	356	2.1		21	40.0	343	56.8		22	30.6	331	38.7		22	17.0
40	34	42.9		13	50.1	23	53.3		17	12.1	12	36.2		19	52.3	0	52.2		21	41.1	348	46.6		22	30.9	336	28.5		22	16.4
1 0	39	34.1	291.1	13	53.1	28	44.1	290.8	17	14.7	17	26.6	290.4	19	54.2	5	42.2	290.0	21	42.3	353	36.4	289.8	22	31.1	341	18.2	289.7	22	15.7
20	44	25.2		13	56.2	33	34.9		17	17.2	22	17.0		19	56.0	10	32.3		21	43.4	358	26.2		22	31.4	346	7.9		22	15.0
40	49	16.4		13	59.2	38	25.7		17	19.7	27	7.4		19	57.9	15	22.3		21	44.4	3	16.0		22	31.6	350	57.6		22	14.3
2 0	54	7.5	291.1	14	2.2	43	16.5	290.8	17	22.2	31	57.8	290.4	19	59.8	20	12.4	290.0	21	45.5	8	5.8	289.8	22	31.8	355	47.3	289.7	22	13.6
20	58	58.6		14	5.3	48	7.2		17	24.7	36	48.2		20	1.6	25	2.4		21	46.6	12	55.6		22	32.0	0	37.0		22	12.9
40	63	49.8		14	8.3	52	58.0		17	27.2	41	38.5		20	3.4	29	52.4		21	47.6	17	45.4		22	32.2	5	26.7		22	12.2
3 0	68	40.9	291.1	14	11.3	57	48.7	290.7	17	29.7	46	28.9	290.4	20	5.3	34	42.5	290.0	21	48.7	22	35.2	289.8	22	32.3	10	16.4	289.7	22	11.4
20	73	32.0		14	14.3	62	39.5		17	32.2	51	19.3		20	7.1	39	32.5		21	49.7	27	25.0		22	32.5	15	6.1		22	10.7
40	78	23.1		14	17.3	67	30.2		17	34.7	56	9.6		20	8.9	44	22.5		21	50.7	32	14.8		22	32.6	19	55.8		22	9.9
4 0	83	14.2	291.1	14	20.3	72	21.0	290.7	17	37.1	60	60.0	290.3	20	10.7	49	12.5	290.0	21	51.7	37	4.6	289.8	22	32.8	24	45.5	289.7	22	9.1
20	88	5.4		14	23.3	77	11.7		17	39.6	65	50.3		20	12.5	54	2.5		21	52.7	41	54.4		22	32.9	29	35.2		22	8.3
40	92	56.5		14	26.3	82	2.4		17	42.0	70	40.7		20	14.2	58	52.6		21	53.7	46	44.2		22	33.0	34	24.9		22	7.5
5 0	97	47.5	291.1	14	29.2	86	53.2	290.7	17	44.4	75	31.0	290.3	20	16.0	63	42.6	290.0	21	54.7	51	33.9	289.8	22	33.1	39	14.7	289.7	22	6.7
20	102	38.6		14	32.2	91	43.9		17	46.9	80	21.3		20	17.7	68	32.6		21	55.7	56	23.7		22	33.2	44	4.4		22	5.9
40	107	29.7		14	35.2	96	34.6		17	49.3	85	11.7		20	19.5	73	22.6		21	56.6	61	13.5		22	33.3	48	54.1		22	5.0
6 0	112	20.8	291.1	14	38.1	101	25.3	290.7	17	51.7	90	2.0	290.3	20	21.2	78	12.5	290.0	21	57.5	66	3.3	289.8	22	33.3	53	43.8	289.7	22	4.2
20	117	11.9		14	41.1	106	16.0		17	54.1	94	52.3		20	22.9	83	2.5		21	58.5	70	53.1		22	33.4	58	33.5		22	3.3
40	122	3.0		14	44.0	111	6.7		17	56.5	99	42.6		20	24.7	87	52.5		21	59.4	75	42.8		22	33.4	63	23.2		22	2.4
7 0	126	54.0	291.1	14	46.9	115	57.4	290.7	17	58.9	104	32.9	290.3	20	26.4	92	42.5	290.0	22	0.3	80	32.6	289.8	22	33.4	68	12.9	289.7	22	1.5
20	131	45.1		14	49.9	120	48.1		18	1.2	109	23.2		20	28.0	97	32.5		22	1.2	85	22.4		22	33.4	73	2.6		22	0.6
40	136	36.2		14	52.8	125	38.8		18	3.6	114	13.5		20	29.7	102	22.4		22	2.1	90	12.1		22	33.4	77	52.3		21	59.7
8 0	141	27.2	291.0	14	55.7	130	29.4	290.7	18	6.0	119	3.8	290.3	20	31.4	107	12.4	290.0	22	2.9	95	1.9	289.8	22	33.4	82	42.0	289.7	21	58.8
20	146	18.3		14	58.6	135	20.1		18	8.3	123	54.1		20	33.1	112	2.4		22	3.8	99	51.7		22	33.4	87	31.7		21	57.8
40	151	9.3		15	1.5	140	10.8		18	10.7	128	44.4		20	34.7	116	52.3		22	4.6	104	41.4		22	33.3	92	21.4		21	56.9
9 0	156	0.3	291.0	15	4.4	145	1.4	290.6	18	13.0	133	34.6	290.3	20	36.3	121	42.3	290.0	22	5.4	109	31.2	289.8	22	33.3	97	11.1	289.7	21	55.9
20	160	51.4		15	7.3	149	52.1		18	15.3	138	24.9		20	38.0	126	32.2		22	6.3	114	20.9		22	33.2	102	0.9		21	54.9
40	165	42.4		15	10.1	154	42.7		18	17.6	143	15.2		20	39.6	131	22.2		22	7.1	119	10.7		22	33.1	106	50.6		21	53.9
10 0	170	33.4	291.0	15	13.0	159	33.4	290.6	18	19.9	148	5.4	290.3	20	41.2	136	12.1	289.9	22	7.9	124	0.5	289.8	22	33.0	111	40.3	289.7	21	52.9
20	175	24.4		15	15.9	164	24.0		18	22.2	152	55.7		20	42.8	141	2.1		22	8.7	128	50.2		22	32.9	116	30.0		21	51.9
40	180	15.5		15	18.7	169	14.6		18	24.5	157	45.9		20	44.4	145	52.0		22	9.4	133	40.0		22	32.8	121	19.7		21	50.9
11 0	185	6.5	291.0	15	21.6	174	5.2	290.6	18	26.8	162	36.2	290.2	20	46.0	150	42.0	289.9	22	10.2	138	29.7	289.7	22	32.7	126	9.4	289.7	21	49.8
20	189	57.5		15	24.4	178	55.9		18	29.1	167	26.4		20	47.5	155	31.9		22	10.9	143	19.5		22	32.5	130	59.1		21	48.8
40	194	48.5		15	27.3	183	46.5		18	31.3	172	16.7		20	49.1	160	21.8		22	11.7	148	9.2		22	32.4	135	48.8		21	47.7
12 0	199	39.5	291.0	15	30.1	188	37.1	290.6	18	33.6	177	6.9	290.2	20	50.6	165	11.7	289.9	22	12.4	152	58.9	289.7	22	32.2	140	38.5	289.7	21	46.6
20	204	30.4		15	32.9	193	27.7		18	35.8	181	57.1		20	52.1	170	1.7		22	13.1	157	48.7		22	32.0	145	28.2		21	45.5
40	209	21.4		15	35.7	198	18.3		18	38.1	186	47.3		20	53.7	174	51.6		22	13.8	162	38.4		22	31.8	150	18.0		21	44.4
13 0	214	12.4	291.0	15	38.6	203	8.9	290.6	18	40.3	191	37.6	290.2	20	55.2	179	41.5	289.9	22	14.5	167	28.2	289.7	22	31.6	155	7.7	289.7	21	43.3
20	219	3.4		15	41.4	207	59.5		18	42.5	196	27.8		20	56.7	184	31.4		22	15.2	172	17.9		22	31.4	159	57.4		21	42.1
40	223	54.3		15	44.1	212	50.1		18	44.7	201	18.0		20	58.2	189	21.3		22	15.8	177	7.7		22	31.2	164	47.1		21	41.0
14 0	228	45.3	291.0	15	46.9	217	40.6	290.6	18	46.9	206	8.2	290.2	20	59.6	194	11.2	289.9	22	16.5	181	57.4	289.7	22	30.9	169	36.8	289.7	21	39.8
20	233	36.3		15	49.7	222	31.2		18	49.1	210	58.4		21	1.1	199	1.1		22	17.1	186	47.1		22	30.7	174	26.5		21	38.7
40	238	27.2		15	52.5	227	21.8		18	51.3	215	48.6		21	2.6	203	51.0		22	17.7	191	36.9		22	30.4	179	16.3		21	37.5
15 0	243	18.2	290.9	15	55.3	232	12.3	290.5	18	53.4	220	38.8	290.2	21	4.0	208	40.9	289.9	22	18.4	196	26.6	289.7	22	30.1	184	6.0	289.7	21	36.3
20	248	9.1		15	58.0	237	2.9		18	55.6	225	28.9		21	5.5	213	30.8		22	19.0	201	16.3		22	29.8	188	55.7		21	35.1
40	253	0.0		16	0.8	241	53.4		18	57.8	230	19.1		21	6.9	218	20.7		22	19.6	206	6.1		22	29.5	193	45.4		21	33.8
16 0	257	51.0	290.9	16	3.5	246	44.0	290.5	18	59.9	235	9.3	290.2	21	8.3	223	10.6	289.9	22	20.1	210	55.8	289.7	22	29.2	198	35.1	289.7	21	32.6
20	262	41.9		16	6.2	251	34.5		19	2.0	239	59.5		21	9.7	228	0.5		22	20.7	215	45.5		22	28.9	203	24.8		21	31.4
40	267	32.8		16	9.0	256	25.0		19	4.2	244	49.6		21	11.1	232	50.4		22	21.3	220	35.2		22	28.5	208	14.6		21	30.1
17 0	272	23.7	290.9	16	11.7	261	15.6	290.5	19	6.3	249	39.8	290.2	21	12.5	237	40.2	289.9	22	21.8	225	25.0	289.7	22	28.2	213	4.3	289.7	21	28.8
20	277	14.6		16	14.4	266	6.1		19	8.4	254	29.9		21	13.8	242	30.1		22	22.3	230	14.7		22	27.8	217	54.0		21	27.5
40	282	5.6		16	17.1	270	56.6		19	10.5	259	20.1		21	15.2	247	20.0		22	22.8	235	4.4		22	27.4	222	43.7		21	26.2
18 0	286	56.5	290.9	16	19.8	275	47.1	290.5	19	12.6	264	10.2	290.1	21	16.5	252	9.8	289.9	22	23.4	239	54.1	289.7	22	27.0	227	33.5	289.7	21	24.9
20	291	47.3		16	22.5	280	37.6		19	14.6	269	0.4		21	17.9	256	59.7		22	23.8	244	43.9		22	26.6	232	23.2		21	23.6
40	296	38.2		16	25.2	285	28.1		19	16.7	273	50.5		21	19.2	261	49.6		22	24.3	249	33.6		22	26.2	237	12.9		21	22.3
19 0	301	29.1	290.9	16	27.9	290	18.6	290.5	19	18.8	278	40.6	290.1	21	20.5	266	39.4	289.9	22	24.8	254	23.3	289.7	22	25.7	242	2.6	289.7	21	20.9
20	306	20.0		16	30.5	295	9.1		19	20.8	283	30.8		21	21.8	271	29.3		22	25.3	259	13.0		22	25.3	246	52.4		21	19.6
40	311	10.9		16	33.2	299	59.6		19	22.9	288	20.9		21	23.1	276	19.1		22	25.7	264	2.7		22	24.8	251	42.1		21	18.2
20 0	316	1.7	290.9	16	35.8	304	50.1	290.5	19	24.9	293	11.0	290.1	21	24.4	281	9.0	289.8	22	26.1	268	52.5	289.7	22	24.3	256	31.8	289.7	21	16.8
20	320	52.6		16	38.5	309	40.5		19	26.9	298	1.1		21	25.7	285	58.8		22	26.5	273	42.2		22	23.9	261	21.6		21	15.4
40	325	43.5		16	41.1	314	31.0		19	28.9	302	51.2		21	26.9	290	48.7		22	27.0	278	31.9		22	23.4	266	11.3		21	14.0
21 0	330	34.3	290.8	16	43.7	319	21.5	290.5	19	30.9	307	41.3	290.1	21	28.2	295	38.5	289.8	22	27.4	283	21.6	289.7	22	22.8	271	1.0	289.7	21	12.6
20	335	25.2		16	46.4	324	11.9		19	32.9	312	31.4		21	29.4	300	28.4		22	27.7	288	11.3		22	22.3	275	50.8		21	11.2
40	340	16.0		16	49.0	329	2.4		19	34.9	317	21.5		21	30.6	305	18.2		22	28.1	293	1.0		22	21.8	280	40.5		21	9.7
22 0	345	6.8	290.8	16	51.6	333	52.8	290.4	19	36.9	322	11.6	290.1	21	31.8	310	8.0	289.8	22	28.5	297	50.8	289.7	22	21.2	285	30.2	289.7	21	8.2
20	349	57.7		16	54.2	338	43.3		19	38.8	327	1.7		21	33.1	314	57.9		22	28.8	302	40.5		22	20.7	290	20.0		21	6.8
40	354	48.5		16	56.8	343	33.7		19	40.8	331	51.8		21	34.2	319	47.7		22	29.1	307	30.2		22	20.1	295	9.7		21	5.3
23 0	359	39.3	290.8	16	59.4	348	24.1	290.4	19	42.7	336	41.9	290.1	21	35.4	324	37.5	289.8	22	29.5	312	19.9	289.7	22	19.5	299	59.4	289.7	21	3.8
20	4	30.1		17	1.9	353	14.6		19	44.7	341	31.9		21	36.6	329	27.3		22	29.8	317	9.6		22	18.9	304	49.2		21	2.3
40	9	20.9		17	4.5	358	5.0		19	46.6	346	22.0		21	37.7	334	17.1		22	30.1	321	59.3		22	18.3	309	38.9		21	0.8

2011 Moon

	15 Nov						16 Nov						17 Nov						18 Nov						19 Nov						20 Nov					
	GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec		
h m	o	'	d	o	'	d '	o	'	d	o	'	d '	o	'	d	o	'	d '	o	'	d	o	'	d '	o	'	d	o	'	d '	o	'	d	o	'	d '
0 0	314	28.7	289.7	20	59.2	-1.5	302	14.6	289.9	18	37.3	-2.4	290	11.5	290.0	15	17.6	-3.2	278	18.5	290.1	11	8.3	-3.8	266	29.8	290.1	6	19.9	-4.2	254	35.5	290.0	1	4.7	-4.5
20	319	18.4		20	57.7		307	4.5		18	34.9		295	1.5		15	14.5		283	8.6		11	4.6		271	19.9		6	15.6		259	25.5		1	0.2	
40	324	8.2		20	56.1		311	54.4		18	32.5		299	51.6		15	11.3		287	58.8		11	0.8		276	10.1		6	11.4		264	15.5		0	55.7	
1 0	328	57.9	289.8	20	54.6	-1.6	316	44.3	289.9	18	30.1	-2.4	304	41.6	290.0	15	8.1	-3.2	292	48.9	290.1	10	57.0	-3.8	281	0.2	290.1	6	7.2	-4.3	269	5.4	290.0	0	51.2	-4.5
20	333	47.7		20	53.0		321	34.2		18	27.7		309	31.7		15	5.0		297	39.1		10	53.2		285	50.4		6	2.9		273	55.4		0	46.7	
40	338	37.4		20	51.4		326	24.0		18	25.3		314	21.7		15	1.8		302	29.2		10	49.4		290	40.5		5	58.7		278	45.4		0	42.2	
2 0	343	27.2	289.8	20	49.8	-1.6	331	13.9	289.9	18	22.8	-2.5	319	11.7	290.0	14	58.6	-3.2	307	19.4	290.2	10	45.6	-3.8	295	30.6	290.1	5	54.4	-4.3	283	35.3	290.0	0	37.7	-4.5
20	348	16.9		20	48.2		336	3.8		18	20.3		324	1.8		14	55.4		312	9.5		10	41.8		300	20.8		5	50.2		288	25.3		0	33.1	
40	353	6.7		20	46.5		340	53.7		18	17.9		328	51.8		14	52.2		316	59.7		10	38.0		305	10.9		5	45.9		293	15.3		0	28.6	
3 0	357	56.4	289.8	20	44.9	-1.7	345	43.6	289.9	18	15.4	-2.5	333	41.9	290.1	14	49.0	-3.3	321	49.8	290.2	10	34.2	-3.8	310	1.1	290.1	5	41.6	-4.3	298	5.2	289.9	0	24.1	-4.5
20	2	46.2		20	43.2		350	33.5		18	12.9		338	31.9		14	45.7		326	40.0		10	30.3		314	51.2		5	37.4		302	55.2		0	19.6	
40	7	35.9		20	41.6		355	23.4		18	10.4		343	22.0		14	42.5		331	30.2		10	26.5		319	41.3		5	33.1		307	45.1		0	15.1	
4 0	12	25.7	289.8	20	39.9	-1.7	0	13.3	289.9	18	7.9	-2.5	348	12.1	290.1	14	39.2	-3.3	336	20.3	290.2	10	22.7	-3.9	324	31.4	290.1	5	28.8	-4.3	312	35.1	289.9	0	10.6	-4.5
20	17	15.5		20	38.2		5	3.2		18	5.3		353	2.1		14	36.0		341	10.5		10	18.8		329	21.6		5	24.5		317	25.0		0	6.0	
40	22	5.2		20	36.5		9	53.1		18	2.8		357	52.2		14	32.7		346	0.6		10	14.9		334	11.7		5	20.2		322	14.9		0	1.5	
5 0	26	55.0	289.8	20	34.8	-1.8	14	43.0	289.9	18	0.3	-2.6	2	42.2	290.1	14	29.4	-3.3	350	50.8	290.2	10	11.1	-3.9	339	1.8	290.1	5	15.9	-4.3	327	4.9	289.9	-0	3.0	-4.5
20	31	44.8		20	33.0		19	32.9		17	57.7		7	32.3		14	26.2		355	40.9		10	7.2		343	52.0		5	11.6		331	54.8		-0	7.5	
40	36	34.5		20	31.3		24	22.9		17	55.1		12	22.4		14	22.9		0	31.1		10	3.3		348	42.1		5	7.3		336	44.7		-0	12.1	
6 0	41	24.3	289.8	20	29.5	-1.8	29	12.8	289.9	17	52.5	-2.6	17	12.4	290.1	14	19.6	-3.3	5	21.2	290.2	9	59.4	-3.9	353	32.2	290.1	5	3.0	-4.3	341	34.6	289.9	-0	16.6	-4.5
20	46	14.1		20	27.8		34	2.7		17	49.9		22	2.5		14	16.3		10	11.4		9	55.5		358	22.3		4	58.7		346	24.6		-0	21.1	
40	51	3.9		20	26.0		38	52.6		17	47.3		26	52.6		14	12.9		15	1.6		9	51.6		3	12.4		4	54.4		351	14.5		-0	25.7	
7 0	55	53.6	289.8	20	24.2	-1.8	43	42.5	289.9	17	44.7	-2.6	31	42.7	290.1	14	9.6	-3.4	19	51.7	290.2	9	47.7	-3.9	8	2.6	290.1	4	50.1	-4.3	356	4.4	289.9	-0	30.2	-4.5
20	60	43.4		20	22.4		48	32.5		17	42.1		36	32.7		14	6.3		24	41.9		9	43.8		12	52.7		4	45.7		0	54.3		-0	34.7	
40	65	33.2		20	20.6		53	22.4		17	39.5		41	22.8		14	2.9		29	32.0		9	39.9		17	42.8		4	41.4		5	44.2		-0	39.3	
8 0	70	23.0	289.8	20	18.8	-1.9	58	12.3	289.9	17	36.8	-2.7	46	12.9	290.1	13	59.5	-3.4	34	22.2	290.2	9	36.0	-4.0	22	32.9	290.1	4	37.1	-4.4	10	34.1	289.9	-0	43.8	-4.5
20	75	12.7		20	16.9		63	2.2		17	34.2		51	3.0		13	56.2		39	12.4		9	32.0		27	23.0		4	32.7		15	24.0		-0	48.3	
40	80	2.5		20	15.1		67	52.2		17	31.5		55	53.1		13	52.8		44	2.5		9	28.1		32	13.1		4	28.4		20	13.8		-0	52.9	
9 0	84	52.3	289.8	20	13.2	-1.9	72	42.1	289.9	17	28.8	-2.7	60	43.1	290.1	13	49.4	-3.4	48	52.7	290.2	9	24.1	-4.0	37	3.2	290.1	4	24.0	-4.3	25	3.7	289.9	-0	57.4	-4.5
20	89	42.1		20	11.3		77	32.0		17	26.1		65	33.2		13	46.0		53	42.9		9	20.2		41	53.3		4	19.7		29	53.6		-1	2.0	
40	94	31.9		20	9.5		82	22.0		17	23.4		70	23.3		13	42.6		58	33.0		9	16.2		46	43.4		4	15.3		34	43.5		-1	6.5	
10 0	99	21.7	289.8	20	7.6	-1.9	87	11.9	289.9	17	20.7	-2.7	75	13.4	290.1	13	39.2	-3.4	63	23.2	290.2	9	12.2	-4.0	51	33.5	290.1	4	11.0	-4.4	39	33.3	289.9	-1	11.0	-4.6
20	104	11.5		20	5.7		92	1.9		17	18.0		80	3.5		13	35.8		68	13.3		9	8.3		56	23.6		4	6.6		44	23.2		-1	15.6	
40	109	1.3		20	3.7		96	51.8		17	15.3		84	53.6		13	32.4		73	3.5		9	4.3		61	13.7		4	2.2		49	13.1		-1	20.1	
11 0	113	51.1	289.8	20	1.8	-2.0	101	41.8	290.0	17	12.5	-2.8	89	43.7	290.1	13	28.9	-3.4	77	53.7	290.2	9	0.3	-4.0	66	3.8	290.1	3	57.9	-4.4	54	2.9	289.8	-1	24.7	-4.5
20	118	40.9		19	59.9		106	31.7		17	9.8		94	33.8		13	25.5		82	43.8		8	56.3		70	53.9		3	53.5		58	52.8		-1	29.2	
40	123	30.7		19	57.9		111	21.7		17	7.0		99	23.9		13	22.0		87	34.0		8	52.3		75	44.0		3	49.1		63	42.6		-1	33.8	
12 0	128	20.5	289.8	19	55.9	-2.0	116	11.6	290.0	17	4.2	-2.8	104	14.0	290.1	13	18.6	-3.5	92	24.2	290.2	8	48.3	-4.0	80	34.1	290.1	3	44.7	-4.4	68	32.4	289.8	-1	38.3	-4.6
20	133	10.3		19	54.0		121	1.6		17	1.5		109	4.1		13	15.1		97	14.3		8	44.2		85	24.2		3	40.3		73	22.3		-1	42.9	
40	138	0.1		19	52.0		125	51.5		16	58.7		113	54.2		13	11.6		102	4.5		8	40.2		90	14.3		3	36.0		78	12.1		-1	47.4	
13 0	142	49.9	289.8	19	50.0	-2.0	130	41.5	290.0	16	55.9	-2.8	118	44.3	290.1	13	8.1	-3.5	106	54.6	290.2	8	36.2	-4.0	95	4.3	290.1	3	31.6	-4.4	83	1.9	289.8	-1	52.0	-4.5
20	147	39.7		19	47.9		135	31.5		16	53.0		123	34.4		13	4.6		111	44.8		8	32.2		99	54.4		3	27.2		87	51.8		-1	56.5	
40	152	29.5		19	45.9		140	21.4		16	50.2		128	24.5		13	1.1		116	35.0		8	28.1		104	44.5		3	22.8		92	41.6		-2	1.1	
14 0	157	19.3	289.8	19	43.9	-2.1	145	11.4	290.0	16	47.4	-2.9	133	14.6	290.1	12	57.6	-3.5	121	25.1	290.2	8	24.1	-4.1	109	34.6	290.1	3	18.3	-4.4	97	31.4	289.8	-2	5.6	-4.6
20	162	9.1		19	41.8		150	1.4		16	44.5		138	4.7		12	54.1		126	15.3		8	20.0		114	24.6		3	13.9		102	21.2		-2	10.2	
40	166	58.9		19	39.8		154	51.4		16	41.7		142	54.8		12	50.5		131	5.4		8	16.0		119	14.7		3	9.5		107	11.0		-2	14.7	
15 0	171	48.8	289.8	19	37.7	-2.1	159	41.3	290.0	16	38.8	-2.9	147	45.0	290.1	12	47.0	-3.6	135	55.6	290.2	8	11.9	-4.1	124	4.8	290.1	3	5.1	-4.4	112	0.8	289.8	-2	19.3	-4.6
20	176	38.6		19	35.6		164	31.3		16	35.9		152	35.1		12	43.5		140	45.8		8	7.8		128	54.8		3	0.7		116	50.6		-2	23.8	
40	181	28.4		19	33.5		169	21.3		16	33.0		157	25.2		12	39.9		145	35.9		8	3.7		133	44.9		2	56.3		121	40.4		-2	28.4	
16 0	186	18.2	289.8	19	31.4	-2.1	174	11.3	290.0	16	30.1	-2.9	162	15.3	290.1	12	36.3	-3.6	150	26.1	290.2	7	59.6	-4.1	138	35.0	290.1	2	51.8	-4.4	126	30.1	289.8	-2	33.0	-4.5
20	191	8.1		19	29.3		179	1.3		16	27.2		167	5.4		12	32.8		155	16.3		7	55.6		143	25.0		2	47.4		131	19.9		-2	37.5	
40	195	57.9		19	27.1		183	51.2		16	24.3		171	55.5		12	29.2		160	6.4		7	51.5		148	15.1		2	43.0		136	9.7		-2	42.1	
17 0	200	47.7	289.8	19	25.0	-2.2	188	41.2	290.0	16	21.4	-3.0	176	45.7	290.1	12	25.6	-3.6	164	56.6	290.2	7	47.4	-4.1	153	5.1	290.0	2	38.5	-4.4	140	59.5	289.8	-2	46.6	-4.6
20	205	37.5		19	22.8		193	31.2		16	18.5		181	35.8		12	22.0		169	46.7		7	43.2		157	55.2		2	34.1		145	49.2		-2	51.2	
40	210	27.4		19	20.7		198	21.2		16	15.5		186	25.9		12	18.4		174	36.9		7	39.1		162	45.2		2	29.6		150	39.0		-2	55.7	
18 0	215	17.2	289.8	19	18.5	-2.2	203	11.2	290.0	16	12.5	-3.0	191	16.0	290.1	12	14.8	-3.6	179	27.1	290.2	7	35.0	-4.1	167	35.2	290.0	2	25.2	-4.5	155	28.7	289.7	-3	0.3	-4.5
20	220	7.1		19	16.3		208	1.2		16	9.6		196	6.2		12	11.1		184	17.2		7	30.9		172	25.3		2	20.8		160	18.5		-3	4.8	
40	224	56.9		19	14.1		212	51.2		16	6.6		200	56.3		12	7.5		189	7.4		7	26.7		177	15.3		2	16.3		165	8.2		-3	9.4	
19 0	229	46.7	289.8	19	11.9	-2.2	217	41.2	290.0	16	3.6	-3.0	205	46.4	290.1	12	3.9	-3.7	193	57.5	290.2	7	22.6	-4.1	182	5.4	290.0	2	11.8	-4.4	169	57.9	289.7	-3	13.9	-4.6
20	234	36.6		19	9.7		222	31.2		16	0.6		210	36.6		12	0.2		198	47.7		7	18.5		186	55.4		2	7.4		174	47.7		-3	18.5	
40	239	26.4		19	7.4		227	21.2		15	57.6		215	26.7		11	56.6		203	37.8		7	14.3		191	45.4		2	2.9		179	37.4		-3	23.0	
20 0	244	16.3	289.9	19	5.2	-2.3	232	11.2	290.0	15	54.6	-3.0	220	16.8	290.1	11	52.9	-3.7	208	28.0	290.2	7	10.2	-4.2	196	35.4	290.0	1	58.5	-4.5	184	27.1	289.7	-3	27.6	-4.5
20	249	6.1		19	2.9		237	1.2		15	51.6		225	7.0		11	49.2		213	18.1		7	6.0		201	25.5		1	54.0		189	16.8		-3	32.1	
40	253	56.0		19	0.7		241	51.3		15	48.5		229	57.1		11	45.5		218	8.3		7	1.8		206	15.5		1	49.5		194	6.5		-3	36.7	
21 0	258	45.8	289.9	18	58.4	-2.3	246	41.3	290.0	15	45.5	-3.1	234	47.2	290.1	11	41.9	-3.7	222	58.5	290.2	6	57.7	-4.2	211	5.5	290.0	1	45.0	-4.5	198	56.2	289.7	-3	41.2	-4.6
20	263	35.7		18	56.1		251	31.3		15	42.4		239	37.4		11	38.2		227	48.6		6	53.5		215	55.5		1	40.6		203	45.9		-3	45.8	
40	268	25.6		18	53.8		256	21.3		15	39.4		244	27.5		11	34.5		232	38.8		6	49.3		220	45.5		1	36.1		208	35.6		-3	50.3	
22 0	273	15.4	289.9	18	51.5	-2.3	261	11.3	290.0	15	36.3	-3.1	249	17.6	290.1	11	30.8	-3.7	237	28.9	290.1	6	45.1	-4.2	225	35.5	290.0	1	31.6	-4.5	213	25.3	289.7	-3	54.9	-4.5
20	278	5.3		19	49.1		266	1.3		15	33.2		254	7.8		11	27.0		242	19.1		6	40.9		230	25.5		1	27.1		218	15.0		-3	59.4	
40	282	55.2		18	46.8		270	51.4		15	30.1		258	57.9		11	23.3		247	9.2		6	36.7		235	15.5		1	22.6		223	4.6		-4	3.9	
23 0	287	45.0	289.9	18	44.5	-2.4	275	41.4	290.0	15	27.0	-3.1	263	48.1	290.1	11	19.6	-3.8	251	59.4	290.1	6	32.5	-4.2	240	5.5	290.0	1	18.2	-4.5	227	54.3	289.7	-4	8.5	-4.5
20	292	34.9		18	42.1		280	31.4		15	23.9		268	38.2		11	15.8		256	49.5		6	28.3		244	55.5		1	13.7		232	44.0		-4	13.0	
40	297	24.8		18	39.7		285	21.5		15	20.7		273	28.4		11	12.1		261	39.6		6	24.1		249	45.5		1	9.2		237	33.6		-4	17.6	

2011 Moon

	21 Nov						22 Nov						23 Nov						24 Nov						25 Nov						26 Nov					
	GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec		
h m	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'	°	'	d	°	'	d'
0 0	242	23.3	289.6	-4	22.1	-4.5	229	40.2	289.1	-9	42.1	-4.3	216	16.2	288.5	-14	33.3	-3.7	202	7.6	287.9	-18	32.0	-2.8	187	22.4	287.5	-21	15.8	-1.7	172	21.3	287.5	-22	29.4	-0.3
20	247	12.9		-4	26.6		234	29.4		-9	46.4		221	4.7		-14	37.1		206	55.5		-18	34.9		192	9.9		-21	17.5		177	8.8		-22	29.8	
40	252	2.5		-4	31.2		239	18.5		-9	50.6		225	53.2		-14	40.8		211	43.4		-18	37.7		196	57.5		-21	19.1		181	56.4		-22	30.1	
1 0	256	52.2	289.6	-4	35.7	-4.5	244	7.6	289.1	-9	54.9	-4.3	230	41.7	288.5	-14	44.5	-3.7	216	31.3	287.9	-18	40.5	-2.8	201	45.0	287.5	-21	20.8	-1.6	186	43.9	287.5	-22	30.4	-0.3
20	261	41.8		-4	40.2		248	56.7		-9	59.2		235	30.2		-14	48.2		221	19.2		-18	43.3		206	32.5		-21	22.4		191	31.4		-22	30.7	
40	266	31.4		-4	44.8		253	45.8		-10	3.5		240	18.6		-14	51.9		226	7.1		-18	46.1		211	20.0		-21	24.0		196	18.9		-22	31.0	
2 0	271	21.0	289.6	-4	49.3	-4.5	258	34.9	289.1	-10	7.8	-4.2	245	7.1	288.5	-14	55.6	-3.6	230	55.0	287.9	-18	48.8	-2.7	216	7.5	287.5	-21	25.6	-1.5	201	6.4	287.5	-22	31.3	-0.2
20	276	10.6		-4	53.8		263	24.0		-10	12.0		249	55.6		-14	59.2		235	42.9		-18	51.6		220	55.1		-21	27.1		205	53.9		-22	31.5	
40	281	0.2		-4	58.4		268	13.1		-10	16.3		254	44.0		-15	2.9		240	30.8		-18	54.3		225	42.6		-21	28.6		210	41.5		-22	31.7	
3 0	285	49.8	289.6	-5	2.9	-4.5	273	2.1	289.0	-10	20.5	-4.2	259	32.5	288.4	-15	6.5	-3.6	245	18.6	287.9	-18	57.0	-2.7	230	30.1	287.5	-21	30.2	-1.5	215	29.0	287.5	-22	32.0	-0.2
20	290	39.4		-5	7.4		277	51.2		-10	24.8		264	20.9		-15	10.2		250	6.5		-18	59.7		235	17.6		-21	31.7		220	16.5		-22	32.1	
40	295	29.0		-5	11.9		282	40.2		-10	29.0		269	9.3		-15	13.8		254	54.3		-19	2.4		240	5.1		-21	33.2		225	4.1		-22	32.3	
4 0	300	18.6	289.6	-5	16.5	-4.5	287	29.3	289.0	-10	33.2	-4.2	273	57.8	288.4	-15	17.4	-3.6	259	42.2	287.8	-19	5.1	-2.6	244	52.6	287.5	-21	34.6	-1.4	229	51.6	287.5	-22	32.5	-0.1
20	305	8.1		-5	21.0		292	18.3		-10	37.5		278	46.2		-15	21.0		264	30.0		-19	7.7		249	40.1		-21	36.1		234	39.1		-22	32.6	
40	309	57.7		-5	25.5		297	7.3		-10	41.7		283	34.6		-15	24.6		269	17.9		-19	10.4		254	27.6		-21	37.5		239	26.7		-22	32.7	
5 0	314	47.2	289.5	-5	30.0	-4.5	301	56.3	289.0	-10	45.9	-4.2	288	23.0	288.4	-15	28.2	-3.6	274	5.7	287.8	-19	13.0	-2.6	259	15.1	287.5	-21	38.9	-1.4	244	14.2	287.6	-22	32.8	-0.1
20	319	36.8		-5	34.5		306	45.4		-10	50.1		293	11.4		-15	31.8		278	53.5		-19	15.6		264	2.6		-21	40.3		249	1.8		-22	32.9	
40	324	26.3		-5	39.0		311	34.4		-10	54.3		297	59.7		-15	35.3		283	41.3		-19	18.2		268	50.1		-21	41.7		253	49.4		-22	33.0	
6 0	329	15.9	289.5	-5	43.5	-4.5	316	23.3	289.0	-10	58.5	-4.2	302	48.1	288.3	-15	38.9	-3.5	288	29.1	287.8	-19	20.8	-2.5	273	37.6	287.5	-21	43.1	-1.3	258	36.9	287.6	-22	33.0	0.0
20	334	5.4		-5	48.0		321	12.3		-11	2.7		307	36.5		-15	42.4		293	16.9		-19	23.3		278	25.1		-21	44.4		263	24.5		-22	33.0	
40	338	54.9		-5	52.5		326	1.3		-11	6.9		312	24.8		-15	45.9		298	4.7		-19	25.9		283	12.5		-21	45.7		268	12.0		-22	33.0	
7 0	343	44.4	289.5	-5	57.0	-4.5	330	50.3	288.9	-11	11.0	-4.2	317	13.1	288.3	-15	49.5	-3.5	302	52.5	287.8	-19	28.4	-2.5	288	0.0	287.5	-21	47.0	-1.3	272	59.6	287.6	-22	33.0	0.0
20	348	33.9		-6	1.5		335	39.2		-11	15.2		322	1.5		-15	53.0		307	40.3		-19	30.9		292	47.5		-21	48.3		277	47.2		-22	33.0	
40	353	23.4		-6	6.0		340	28.2		-11	19.3		326	49.8		-15	56.4		312	28.0		-19	33.4		297	35.0		-21	49.6		282	34.8		-22	32.9	
8 0	358	12.9	289.5	-6	10.5	-4.5	345	17.1	288.9	-11	23.5	-4.1	331	38.1	288.3	-15	59.9	-3.5	317	15.8	287.8	-19	35.9	-2.5	302	22.5	287.5	-21	50.8	-1.2	287	22.4	287.6	-22	32.9	0.1
20	3	2.4		-6	15.0		350	6.1		-11	27.6		336	26.4		-16	3.4		322	3.6		-19	38.4		307	9.9		-21	52.1		292	10.0		-22	32.8	
40	7	51.9		-6	19.5		354	55.0		-11	31.8		341	14.7		-16	6.8		326	51.3		-19	40.8		311	57.4		-21	53.3		296	57.6		-22	32.7	
9 0	12	41.4	289.5	-6	24.0	-4.5	359	43.9	288.9	-11	35.9	-4.1	346	3.0	288.3	-16	10.3	-3.4	331	39.1	287.7	-19	43.3	-2.4	316	44.9	287.5	-21	54.5	-1.2	301	45.2	287.6	-22	32.6	0.2
20	17	30.8		-6	28.5		4	32.8		-11	40.0		350	51.3		-16	13.7		336	26.8		-19	45.7		321	32.4		-21	55.7		306	32.8		-22	32.4	
40	22	20.3		-6	33.0		9	21.7		-11	44.2		355	39.6		-16	17.1		341	14.6		-19	48.1		326	19.8		-21	56.8		311	20.4		-22	32.3	
10 0	27	9.8	289.4	-6	37.4	-4.5	14	10.6	288.9	-11	48.3	-4.1	0	27.8	288.2	-16	20.6	-3.4	346	2.3	287.7	-19	50.5	-2.4	331	7.3	287.5	-21	58.0	-1.1	316	8.0	287.6	-22	32.1	0.2
20	31	59.2		-6	41.9		18	59.5		-11	52.4		5	16.1		-16	23.9		350	50.0		-19	52.9		335	54.8		-21	59.1		320	55.6		-22	31.9	
40	36	48.6		-6	46.4		23	48.3		-11	56.5		10	4.3		-16	27.3		355	37.7		-19	55.2		340	42.3		-22	0.2		325	43.2		-22	31.7	
11 0	41	38.1	289.4	-6	50.8	-4.5	28	37.2	288.8	-12	0.5	-4.1	14	52.6	288.2	-16	30.7	-3.3	0	25.4	287.7	-19	57.6	-2.3	345	29.7	287.5	-22	1.3	-1.0	330	30.9	287.6	-22	31.5	0.3
20	46	27.5		-6	55.3		33	26.1		-12	4.6		19	40.8		-16	34.1		5	13.1		-19	59.9		350	17.2		-22	2.4		335	18.5		-22	31.2	
40	51	16.9		-6	59.8		38	14.9		-12	8.7		24	29.0		-16	37.4		10	0.9		-20	2.2		355	4.7		-22	3.4		340	6.1		-22	31.0	
12 0	56	6.3	289.4	-7	4.2	-4.5	43	3.8	288.8	-12	12.8	-4.0	29	17.2	288.2	-16	40.7	-3.3	14	48.5	287.7	-20	4.5	-2.3	359	52.1	287.5	-22	4.4	-1.0	344	53.8	287.7	-22	30.7	0.3
20	60	55.7		-7	8.7		47	52.6		-12	16.8		34	5.4		-16	44.1		19	36.2		-20	6.8		4	39.6		-22	5.5		349	41.4		-22	30.4	
40	65	45.1		-7	13.1		52	41.4		-12	20.9		38	53.6		-16	47.4		24	23.9		-20	9.0		9	27.1		-22	6.5		354	29.1		-22	30.1	
13 0	70	34.5	289.4	-7	17.6	-4.4	57	30.2	288.8	-12	24.9	-4.0	43	41.8	288.2	-16	50.7	-3.3	29	11.6	287.7	-20	11.3	-2.2	14	14.5	287.5	-22	7.4	-1.0	359	16.7	287.7	-22	29.8	0.4
20	75	23.9		-7	22.0		62	19.0		-12	28.9		48	30.0		-16	54.0		33	59.3		-20	13.5		19	2.0		-22	8.4		4	4.4		-22	29.4	
40	80	13.3		-7	26.5		67	7.8		-12	33.0		53	18.2		-16	57.2		38	46.9		-20	15.7		23	49.5		-22	9.3		8	52.1		-22	29.0	
14 0	85	2.7	289.4	-7	30.9	-4.4	71	56.6	288.8	-12	37.0	-4.0	58	6.4	288.1	-17	0.5	-3.2	43	34.6	287.7	-20	17.9	-2.2	28	36.9	287.5	-22	10.3	-0.9	13	39.7	287.7	-22	28.6	0.4
20	89	52.0		-7	35.3		76	45.4		-12	41.0		62	54.5		-17	3.7		48	22.3		-20	20.1		33	24.4		-22	11.2		18	27.4		-22	28.2	
40	94	41.4		-7	39.8		81	34.2		-12	45.0		67	42.7		-17	7.0		53	9.9		-20	22.2		38	11.9		-22	12.1		23	15.1		-22	27.8	
15 0	99	30.7	289.3	-7	44.2	-4.4	86	22.9	288.7	-12	49.0	-4.0	72	30.8	288.1	-17	10.2	-3.2	57	57.6	287.6	-20	24.4	-2.1	42	59.3	287.5	-22	12.9	-0.8	28	2.8	287.7	-22	27.4	0.5
20	104	20.1		-7	48.6		91	11.7		-12	53.0		77	18.9		-17	13.4		62	45.2		-20	26.5		47	46.8		-22	13.8		32	50.5		-22	26.9	
40	109	9.4		-7	53.0		96	0.4		-12	56.9		82	7.1		-17	16.6		67	32.9		-20	28.6		52	34.3		-22	14.6		37	38.2		-22	26.5	
16 0	113	58.7	289.3	-7	57.5	-4.4	100	49.1	288.7	-13	0.9	-3.9	86	55.2	288.1	-17	19.8	-3.1	72	20.5	287.6	-20	30.7	-2.1	57	21.7	287.5	-22	15.4	-0.8	42	25.9	287.7	-22	26.0	0.5
20	118	48.0		-8	1.9		105	37.9		-13	4.9		91	43.3		-17	22.9		77	8.1		-20	32.8		62	9.2		-22	16.2		47	13.7		-22	25.5	
40	123	37.3		-8	6.3		110	26.6		-13	8.8		96	31.4		-17	26.1		81	55.7		-20	34.8		66	56.7		-22	17.0		52	1.4		-22	24.9	
17 0	128	26.6	289.3	-8	10.7	-4.4	115	15.3	288.7	-13	12.7	-3.9	101	19.5	288.1	-17	29.2	-3.1	86	43.4	287.6	-20	36.9	-2.0	71	44.2	287.5	-22	17.7	-0.7	56	49.1	287.7	-22	24.4	0.6
20	133	15.9		-8	15.1		120	4.0		-13	16.7		106	7.5		-17	32.4		91	31.0		-20	38.9		76	31.6		-22	18.5		61	36.9		-22	23.8	
40	138	5.2		-8	19.5		124	52.7		-13	20.6		110	55.6		-17	35.5		96	18.6		-20	40.9		81	19.1		-22	19.2		66	24.6		-22	23.2	
18 0	142	54.5	289.3	-8	23.9	-4.4	129	41.4	288.7	-13	24.5	-3.9	115	43.7	288.1	-17	38.6	-3.1	101	6.2	287.6	-20	42.9	-2.0	86	6.6	287.5	-22	19.9	-0.7	71	12.3	287.8	-22	22.6	0.6
20	147	43.8		-8	28.2		134	30.0		-13	28.4		120	31.7		-17	41.7		105	53.8		-20	44.9		90	54.0		-22	20.6		76	0.1		-22	22.0	
40	152	33.0		-8	32.6		139	18.7		-13	32.3		125	19.8		-17	44.7		110	41.4		-20	46.8		95	41.5		-22	21.3		80	47.9		-22	21.4	
19 0	157	22.3	289.2	-8	37.0	-4.4	144	7.4	288.6	-13	36.2	-3.9	130	7.8	288.0	-17	47.8	-3.0	115	29.0	287.6	-20	48.8	-1.9	100	29.0	287.5	-22	21.9	-0.6	85	35.6	287.8	-22	20.8	0.7
20	162	11.6		-8	41.4		148	56.0		-13	40.1		134	55.9		-17	50.8		120	16.6		-20	50.7		105	16.5		-22	22.5		90	23.4		-22	20.1	
40	167	0.8		-8	45.7		153	44.7		-13	43.9		139	43.9		-17	53.9		125	4.2		-20	52.6		110	4.0		-22	23.2		95	11.2		-22	19.4	
20 0	171	50.0	289.2	-8	50.1	-4.4	158	33.3	288.6	-13	47.8	-3.8	144	31.9	288.0	-17	56.9	-3.0	129	51.7	287.6	-20	54.5	-1.9	114	51.4	287.5	-22	23.7	-0.6	99	59.0	287.8	-22	18.7	0.7
20	176	39.3		-8	54.5		163	21.9		-13	51.6		149	19.9		-17	59.9		134	39.3		-20	56.4		119	38.9		-22	24.3		104	46.8		-22	18.0	
40	181	28.5		-8	58.8		168	10.5		-13	55.5		154	7.9		-18	2.9		139	26.9		-20	58.2		124	26.4		-22	24.9		109	34.6		-22	17.3	
21 0	186	17.7	289.2	-9	3.2	-4.3	172	59.1	288.6	-13	59.3	-3.8	158	55.9	288.0	-18	5.9	-2.9	144	14.4	287.6	-21	0.1	-1.8	129	13.9	287.5	-22	25.4	-0.5	114	22.4	287.8	-22	16.5	0.8
20	191	6.9		-9	7.5		177	47.7		-14	3.1		163	43.9		-18	8.8		149	2.0		-21	1.9		134	1.4		-22	25.9		119	10.2		-22	15.7	
40	195	56.1		-9	11.8		182	36.3		-14	6.9		168	31.9		-18	11.8		153	49.6		-21	3.7		138	48.9		-22	26.4		123	58.1		-22	15.0	
22 0	200	45.3	289.2	-9	16.2	-4.3	187	24.9	288.6	-14	10.7	-3.8	173	19.9	288.0	-18	14.7	-2.9	158	37.1	287.6	-21	5.5	-1.7	143	36.3	287.5	-22	26.9	-0.5	128	45.9	287.9	-22	14.2	0.8
20	205	34.5		-9	20.5		192	13.4		-14	14.5		178	7.9		-18	17.6		163	24.7		-21	7.3		148	23.8		-22	27.4		133	33.7		-22	13.3	
40	210	23.6		-9	24.8		197	2.0		-14	18.3		182	55.8		-18	20.5		168	12.2		-21	9.0		153	11.3		-22	27.8		138	21.6		-22	12.5	
23 0	215	12.8	289.1	-9	29.1	-4.3	201	50.6	288.5	-14	22.1	-3.7	187	43.8	287.9	-18	23.4	-2.9	172	59.8	287.5	-21	10.7	-1.7	157	58.8	287.5	-22	28.3	-0.4	143	9.4	287.9	-22	11.7	0.9
20	220	1.9		-9	33.5		206	39.1		-14	25.8		192	31.7		-18	26.3		177	47.3		-21	12.5		162	46.3		-22	28.7		147	57.3		-22	10.8	
40	224	51.1		-9	37.8		211	27.6		-14	29.6		197	19.6		-18	29.2		182	34.9		-21	14.2		167	33.8		-22	29.1		152	45.2		-22	9.9	

2011 Moon

	27 Nov							28 Nov							29 Nov							30 Nov							1 Dec							2 Dec						
	GHA			Dec				GHA			Dec				GHA			Dec				GHA			Dec				GHA			Dec				GHA			Dec			
h m	°	'	d	°	'	d	'	°	'	d	°	'	d	'	°	'	d	°	'	d	'	°	'	d	°	'	d	'	°	'	d	°	'	d	'	°	'	d	°	'	d	'
0 0	157	33.1	287.9	-22	9.0	0.9		143	24.1	288.6	-20	22.9	2.0		130	10.3	289.4	-17	27.8	2.8		117	54.6	290.2	-13	43.1	3.4		106	30.5	290.8	-9	26.7	3.7		95	46.0	291.3	-4	53.3	3.9	
20	162	21.0		-22	8.1			148	12.7		-20	20.9			134	59.7		-17	25.0			122	44.8		-13	39.7			111	21.3		-9	23.0			100	37.3		-4	49.5		
40	167	8.9		-22	7.1			153	1.3		-20	18.9			139	49.1		-17	22.2			127	35.0		-13	36.3			116	12.1		-9	19.2			105	28.6		-4	45.6		
1 0	171	56.8	287.9	-22	6.2	1.0		157	49.9	288.6	-20	16.9	2.1		144	38.5	289.4	-17	19.3	2.9		132	25.1	290.2	-13	32.9	3.4		121	2.9	290.8	-9	15.5	3.7		110	19.8	291.3	-4	41.7	3.8	
20	176	44.7		-22	5.2			162	38.5		-20	14.8			149	27.9		-17	16.5			137	15.3		-13	29.5			125	53.7		-9	11.8			115	11.1		-4	37.9		
40	181	32.6		-22	4.2			167	27.1		-20	12.8			154	17.3		-17	13.6			142	5.5		-13	26.1			130	44.6		-9	8.1			120	2.4		-4	34.0		
2 0	186	20.5	287.9	-22	3.2	1.0		172	15.7	288.7	-20	10.7	2.1		159	6.8	289.5	-17	10.7	2.9		146	55.8	290.2	-13	22.7	3.4		135	35.4	290.9	-9	4.4	3.7		124	53.7	291.3	-4	30.2	3.9	
20	191	8.4		-22	2.2			177	4.4		-20	8.6			163	56.3		-17	7.9			151	46.0		-13	19.3			140	26.3		-9	0.6			129	45.0		-4	26.3		
40	195	56.4		-22	1.2			181	53.0		-20	6.5			168	45.7		-17	5.0			156	36.2		-13	15.9			145	17.1		-8	56.9			134	36.3		-4	22.4		
3 0	200	44.3	288.0	-22	0.1	1.1		186	41.7	288.7	-20	4.4	2.1		173	35.2	289.5	-17	2.1	2.9		161	26.5	290.3	-13	12.4	3.4		150	8.0	290.9	-8	53.2	3.8		139	27.6	291.3	-4	18.6	3.9	
20	205	32.3		-21	59.1			191	30.4		-20	2.3			178	24.7		-16	59.2			166	16.7		-13	9.0			154	58.9		-8	49.4			144	18.9		-4	14.7		
40	210	20.3		-21	58.0			196	19.0		-20	0.2			183	14.2		-16	56.2			171	7.0		-13	5.6			159	49.8		-8	45.7			149	10.2		-4	10.8		
4 0	215	8.3	288.0	-21	56.9	1.1		201	7.7	288.7	-19	58.0	2.2		188	3.7	289.5	-16	53.3	2.9		175	57.3	290.3	-13	2.1	3.5		164	40.7	290.9	-8	41.9	3.7		154	1.5	291.3	-4	7.0	3.9	
20	219	56.2		-21	55.8			205	56.5		-19	55.9			192	53.2		-16	50.4			180	47.6		-12	58.7			169	31.6		-8	38.2			158	52.8		-4	3.1		
40	224	44.2		-21	54.6			210	45.2		-19	53.7			197	42.8		-16	47.4			185	37.9		-12	55.2			174	22.5		-8	34.4			163	44.2		-3	59.2		
5 0	229	32.2	288.0	-21	53.5	1.2		215	33.9	288.8	-19	51.5	2.2		202	32.3	289.6	-16	44.5	3.0		190	28.2	290.3	-12	51.7	3.5		179	13.4	290.9	-8	30.7	3.8		168	35.5	291.3	-3	55.4	3.9	
20	234	20.2		-21	52.3			220	22.6		-19	49.3			207	21.9		-16	41.5			195	18.5		-12	48.3			184	4.3		-8	26.9			173	26.8		-3	51.5		
40	239	8.3		-21	51.2			225	11.4		-19	47.1			212	11.5		-16	38.5			200	8.8		-12	44.8			188	55.2		-8	23.2			178	18.2		-3	47.6		
6 0	243	56.3	288.0	-21	50.0	1.2		230	0.2	288.8	-19	44.9	2.3		217	1.0	289.6	-16	35.6	3.0		204	59.1	290.4	-12	41.3	3.5		193	46.2	290.9	-8	19.4	3.8		183	9.5	291.4	-3	43.8	3.9	
20	248	44.3		-21	48.8			234	48.9		-19	42.6			221	50.6		-16	32.6			209	49.5		-12	37.8			198	37.1		-8	15.6			188	0.9		-3	39.9		
40	253	32.4		-21	47.5			239	37.7		-19	40.4			226	40.2		-16	29.6			214	39.8		-12	34.4			203	28.0		-8	11.9			192	52.2		-3	36.0		
7 0	258	20.4	288.1	-21	46.3	1.3		244	26.5	288.8	-19	38.1	2.3		231	29.9	289.6	-16	26.6	3.0		219	30.2	290.4	-12	30.9	3.5		208	19.0	291.0	-8	8.1	3.8		197	43.6	291.4	-3	32.1	3.9	
20	263	8.5		-21	45.0			249	15.3		-19	35.9			236	19.5		-16	23.6			224	20.6		-12	27.4			213	10.0		-8	4.3			202	34.9		-3	28.3		
40	267	56.6		-21	43.7			254	4.1		-19	33.6			241	9.1		-16	20.5			229	11.0		-12	23.9			218	0.9		-8	0.6			207	26.3		-3	24.4		
8 0	272	44.7	288.1	-21	42.5	1.3		258	53.0	288.9	-19	31.3	2.3		245	58.8	289.7	-16	17.5	3.0		234	1.4	290.4	-12	20.3	3.5		222	51.9	291.0	-7	56.8	3.8		212	17.7	291.4	-3	20.5	3.9	
20	277	32.8		-21	41.2			263	41.8		-19	29.0			250	48.4		-16	14.5			238	51.7		-12	16.8			227	42.9		-7	53.0			217	9.0		-3	16.7		
40	282	20.9		-21	39.8			268	30.7		-19	26.7			255	38.1		-16	11.4			243	42.2		-12	13.3			232	33.9		-7	49.2			222	0.4		-3	12.8		
9 0	287	9.0	288.1	-21	38.5	1.4		273	19.5	288.9	-19	24.3	2.3		260	27.8	289.7	-16	8.4	3.1		248	32.6	290.4	-12	9.8	3.5		237	24.9	291.0	-7	45.5	3.8		226	51.8	291.4	-3	8.9	3.9	
20	291	57.1		-21	37.1			278	8.4		-19	22.0			265	17.5		-16	5.3			253	23.0		-12	6.3			242	15.9		-7	41.7			231	43.2		-3	5.0		
40	296	45.2		-21	35.8			282	57.3		-19	19.6			270	7.2		-16	2.2			258	13.4		-12	2.7			247	6.9		-7	37.9			236	34.6		-3	1.2		
10 0	301	33.3	288.2	-21	34.4	1.4		287	46.2	288.9	-19	17.3	2.4		274	56.9	289.7	-15	59.1	3.1		263	3.9	290.5	-11	59.2	3.6		251	57.9	291.0	-7	34.1	3.8		241	26.0	291.4	-2	57.3	3.9	
20	306	21.5		-21	33.0			292	35.1		-19	14.9			279	46.6		-15	56.0			267	54.3		-11	55.6			256	48.9		-7	30.3			246	17.4		-2	53.4		
40	311	9.7		-21	31.6			297	24.0		-19	12.5			284	36.4		-15	53.0			272	44.8		-11	52.1			261	39.9		-7	26.5			251	8.8		-2	49.5		
11 0	315	57.8	288.2	-21	30.1	1.4		302	13.0	289.0	-19	10.1	2.4		289	26.1	289.8	-15	49.8	3.1		277	35.3	290.5	-11	48.5	3.6		266	31.0	291.0	-7	22.7	3.8		256	0.2	291.4	-2	45.7	3.9	
20	320	46.0		-21	28.7			307	1.9		-19	7.7			294	15.9		-15	46.7			282	25.8		-11	45.0			271	22.0		-7	18.9			260	51.6		-2	41.8		
40	325	34.2		-21	27.2			311	50.9		-19	5.2			299	5.6		-15	43.6			287	16.3		-11	41.4			276	13.1		-7	15.1			265	43.0		-2	37.9		
12 0	330	22.4	288.2	-21	25.8	1.5		316	39.8	289.0	-19	2.8	2.5		303	55.4	289.8	-15	40.5	3.1		292	6.8	290.5	-11	37.8	3.6		281	4.1	291.1	-7	11.3	3.8		270	34.4	291.4	-2	34.0	3.9	
20	335	10.6		-21	24.3			321	28.8		-19	0.4			308	45.2		-15	37.4			296	57.3		-11	34.3			285	55.2		-7	7.5			275	25.8		-2	30.2		
40	339	58.8		-21	22.8			326	17.8		-18	57.9			313	35.0		-15	34.2			301	47.8		-11	30.7			290	46.3		-7	3.7			280	17.2		-2	26.3		
13 0	344	47.0	288.2	-21	21.2	1.5		331	6.8	289.0	-18	55.4	2.5		318	24.8	289.8	-15	31.1	3.2		306	38.3	290.5	-11	27.1	3.6		295	37.3	291.1	-6	59.9	3.8		285	8.7	291.4	-2	22.4	3.9	
20	349	35.3		-21	19.7			335	55.8		-18	52.9			323	14.6		-15	27.9			311	28.9		-11	23.5			300	28.4		-6	56.1			290	0.1		-2	18.5		
40	354	23.5		-21	18.2			340	44.8		-18	50.4			328	4.5		-15	24.7			316	19.4		-11	19.9			305	19.5		-6	52.3			294	51.5		-2	14.7		
14 0	359	11.7	288.3	-21	16.6	1.6		345	33.9	289.1	-18	47.9	2.5		332	54.3	289.9	-15	21.6	3.2		321	9.9	290.6	-11	16.3	3.6		310	10.6	291.1	-6	48.5	3.8		299	43.0	291.4	-2	10.8	3.9	
20	4	0.0		-21	15.0			350	22.9		-18	45.4			337	44.2		-15	18.4			326	0.5		-11	12.7			315	1.7		-6	44.6			304	34.4		-2	6.9		
40	8	48.3		-21	13.4			355	12.0		-18	42.9			342	34.1		-15	15.2			330	51.1		-11	9.1			319	52.8		-6	40.8			309	25.9		-2	3.0		
15 0	13	36.6	288.3	-21	11.8	1.6		0	1.1	289.1	-18	40.4	2.6		347	23.9	289.9	-15	12.0	3.2		335	41.7	290.6	-11	5.5	3.6		324	43.9	291.1	-6	37.0	3.8		314	17.3	291.5	-1	59.2	3.9	
20	18	24.9		-21	10.2			4	50.1		-18	37.8			352	13.8		-15	8.8			340	32.3		-11	1.9			329	35.0		-6	33.2			319	8.8		-1	55.3		
40	23	13.2		-21	8.5			9	39.2		-18	35.2			357	3.7		-15	5.6			345	22.8		-10	58.3			334	26.1		-6	29.4			324	0.2		-1	51.4		
16 0	28	1.5	288.3	-21	6.9	1.7		14	28.3	289.1	-18	32.7	2.6		1	53.6	289.9	-15	2.4	3.2		350	13.5	290.6	-10	54.7	3.6		339	17.3	291.1	-6	25.5	3.8		328	51.7	291.5	-1	47.5	3.9	
20	32	49.8		-21	5.2			19	17.5		-18	30.1			6	43.6		-14	59.1			355	4.1		-10	51.1			344	8.4		-6	21.7			333	43.1		-1	43.7		
40	37	38.1		-21	3.5			24	6.6		-18	27.5			11	33.5		-14	55.9			359	54.7		-10	47.4			348	59.5		-6	17.9			338	34.6		-1	39.8		
17 0	42	26.5	288.4	-21	1.8	1.7		28	55.7	289.2	-18	24.9	2.6		16	23.4	290.0	-14	52.7	3.3		4	45.3	290.6	-10	43.8	3.6		353	50.7	291.2	-6	14.1	3.8		343	26.1	291.5	-1	35.9	3.9	
20	47	14.8		-21	0.1			33	44.9		-18	22.3			21	13.4		-14	49.4			9	36.0		-10	40.2			358	41.8		-6	10.2			348	17.5		-1	32.0		
40	52	3.2		-20	58.4			38	34.0		-18	19.7			26	3.3		-14	46.2			14	26.6		-10	36.5			3	33.0		-6	6.4			353	9.0		-1	28.2		
18 0	56	51.6	288.4	-20	56.7	1.8		43	23.2	289.2	-18	17.0	2.7		30	53.3	290.0	-14	42.9	3.3		19	17.3	290.7	-10	32.9	3.7		8	24.2	291.2	-6	2.6	3.9		358	0.5	291.5	-1	24.3	3.9	
20	61	40.0		-20	54.9			48	12.4		-18	14.4			35	43.3		-14	39.6			24	7.9		-10	29.2			13	15.3		-5	58.7			2	52.0		-1	20.4		
40	66	28.4		-20	53.1			53	1.6		-18	11.7			40	33.3		-14	36.4			28	58.6		-10	25.6			18	6.5		-5	54.9			7	43.4		-1	16.6		
19 0	71	16.8	288.4	-20	51.3	1.8		57	50.8	289.2	-18	9.0	2.7		45	23.3	290.0	-14	33.1	3.3		33	49.3	290.7	-10	21.9	3.7		22	57.7	291.2	-5	51.0	3.8		12	34.9	291.5	-1	12.7	3.9	
20	76	5.2		-20	49.5			62	40.0		-18	6.4			50	13.3		-14	29.8			38	40.0		-10	18.3			27	48.9		-5	47.2			17	26.4		-1	8.8		
40	80	53.6		-20	47.7			67	29.2		-18	3.7			55	3.3		-14	26.5			43	30.7		-10	14.6			32	40.1		-5	43.4			22	17.9		-1	4.9		
20 0	85	42.0	288.5	-20	45.9	1.8		72	18.5	289.3	-18	1.0	2.7		59	53.4	290.1	-14	23.2	3.3		48	21.4	290.7	-10	10.9	3.7		37	31.3	291.2	-5	39.5	3.8		27	9.4	291.5	-1	1.1	3.9	
20	90	30.5		-20	44.1			77	7.7		-17	58.3			64	43.4		-14	19.9			53	12.1		-10	7.3			42	22.5		-5	35.7			32	0.9		-0	57.2		
40	95	18.9		-20	42.2			81	57.0		-17	55.6			69	33.5		-14	16.6			58	2.8		-10	3.6			47	13.7		-5	31.8			36	52.4		-0	53.3		
21 0	100	7.4	288.5	-20	40.4	1.9		86	46.3	289.3	-17	52.8	2.7		74	23.5	290.1	-14	13.3	3.3		62	53.5	290.7	-9	59.9	3.7		52	4.9	291.2	-5	28.0	3.9		41	43.9	291.5	-0	49.5	3.9	
20	104	55.9		-20	38.5			91	35.6		-17	50.1			79	13.6		-14	9.9			67	44.3		-9	56.2			56	56.1		-5	24.1			46	35.4		-0	45.6		
40	109	44.4		-20	36.6			96	24.9		-17	47.3			84	3.7		-14	6.6			72	35.0		-9	52.6			61	47.3		-5	20.3			51	26.9		-0	41.7		
22 0	114	32.9	288.5	-20	34.7	1.9		101	14.2	289.3	-17	44.6	2.8		88	53.8	290.1	-14	3.3	3.4		77	25.8	290.8	-9	48.9	3.7		66	38.5	291.2	-5	16.4	3.8		56	18.4	291.5	-0	37.9	3.9	
20	119	21.4		-20	32.7			106	3.5		-17	41.8			93	43.9		-13	59.9			82	16.5		-9	45.2			71	29.8		-5	12.6			61	9.9		-0	34.0		
40	124	9.9		-20	30.8			110	52.8		-17	39.0			98	34.0		-13	56.6			87	7.3		-9	41.5			76	21.0		-5	8.7			66	1.4		-0	30.1		
23 0	128	58.4	288.6	-20	28.9	2.0		115	42.2	289.4	-17	36.3	2.8		103	24.2	290.1	-13	53.2	3.4		91	58.1	290.8	-9	37.8	3.7		81	12.3	291.3	-5	4.9	3.9		70	53.0	291.5	-0	26.3	3.9	
20	133	47.0		-20	26.9			120	31.5		-17	33.5			108	14.3		-13	49.8			96	48.9		-9	34.1			86	3.5		-5	1.0			75	44.5		-0	22.4		
40	138	35.5		-20	24.9			125	20.9		-17	30.7			113	4.4		-13	46.5			101	39.7		-9	30.4			90	54.8		-4	57.2			80	36.0		-0	18.6		

2011 Moon

	3 Dec					4 Dec					5 Dec					6 Dec					7 Dec					8 Dec				
	GHA			Dec		GHA			Dec		GHA			Dec		GHA			Dec		GHA			Dec		GHA			Dec	
h m	°	'	d	°	'	d	°	'	d	°	'	d	°	'	d	°	'	d	°	'	d	°	'	d	°	'	d	°	'	d
0 0	85	27.5	291.5	-0	14.7	3.9	75	21.2	291.6	4	19.7	3.8	65	14.0	291.5	8	41.7	3.5	54	54.6	291.3	12	43.1	3.2	44	13.5	290.9	16	15.3	2.7	33	4.3	290.5	19	8.9	2.1
20	90	19.1		-0	10.8		80	12.8		4	23.5		70	5.5		8	45.2		59	45.9		12	46.3		49	4.4		16	18.0		37	54.8		19	11.0	
40	95	10.6		-0	7.0		85	4.4		4	27.2		74	57.0		8	48.7		64	37.1		12	49.4		53	55.3		16	20.6		42	45.3		19	13.1	
1 0	100	2.1	291.5	-0	3.1	3.9	89	56.0	291.6	4	31.0	3.7	79	48.5	291.5	8	52.2	3.5	69	28.4	291.2	12	52.6	3.1	58	46.2	290.9	16	23.3	2.7	47	35.8	290.5	19	15.2	2.0
20	104	53.6		0	0.7		94	47.6		4	34.7		84	40.0		8	55.7		74	19.6		12	55.7		63	37.1		16	26.0		52	26.2		19	17.2	
40	109	45.2		0	4.6		99	39.2		4	38.4		89	31.5		8	59.2		79	10.9		12	58.9		68	27.9		16	28.7		57	16.7		19	19.3	
2 0	114	36.7	291.5	0	8.5	3.8	104	30.8	291.6	4	42.2	3.7	94	23.0	291.5	9	2.7	3.5	84	2.1	291.2	13	2.0	3.1	73	18.8	290.9	16	31.3	2.7	62	7.2	290.5	19	21.3	2.0
20	119	28.3		0	12.3		109	22.4		4	45.9		99	14.5		9	6.2		88	53.3		13	5.1		78	9.7		16	34.0		66	57.6		19	23.4	
40	124	19.8		0	16.2		114	14.0		4	49.6		104	6.0		9	9.7		93	44.6		13	8.3		83	0.6		16	36.6		71	48.1		19	25.4	
3 0	129	11.3	291.5	0	20.0	3.9	119	5.6	291.6	4	53.3	3.7	108	57.5	291.5	9	13.2	3.5	98	35.8	291.2	13	11.4	3.1	87	51.4	290.9	16	39.3	2.6	76	38.5	290.4	19	27.4	2.0
20	134	2.9		0	23.9		123	57.2		4	57.1		113	49.0		9	16.7		103	27.0		13	14.5		92	42.3		16	41.9		81	29.0		19	29.4	
40	138	54.4		0	27.7		128	48.8		5	0.8		118	40.5		9	20.1		108	18.2		13	17.6		97	33.1		16	44.5		86	19.4		19	31.4	
4 0	143	46.0	291.6	0	31.6	3.8	133	40.4	291.6	5	4.5	3.7	123	31.9	291.5	9	23.6	3.5	113	9.5	291.2	13	20.7	3.1	102	24.0	290.8	16	47.1	2.6	91	9.8	290.4	19	33.4	2.0
20	148	37.5		0	35.4		138	32.0		5	8.2		128	23.4		9	27.1		118	0.7		13	23.8		107	14.8		16	49.7		96	0.3		19	35.4	
40	153	29.1		0	39.3		143	23.6		5	11.9		133	14.9		9	30.5		122	51.9		13	26.9		112	5.7		16	52.3		100	50.7		19	37.4	
5 0	158	20.6	291.6	0	43.1	3.8	148	15.2	291.6	5	15.6	3.7	138	6.3	291.5	9	34.0	3.4	127	43.1	291.2	13	30.0	3.1	116	56.5	290.8	16	54.9	2.6	105	41.1	290.4	19	39.3	2.0
20	163	12.2		0	47.0		153	6.8		5	19.3		142	57.8		9	37.4		132	34.3		13	33.1		121	47.3		16	57.5		110	31.5		19	41.3	
40	168	3.8		0	50.8		157	58.3		5	23.0		147	49.3		9	40.9		137	25.5		13	36.2		126	38.1		17	0.1		115	21.9		19	43.2	
6 0	172	55.3	291.6	0	54.6	3.9	162	49.9	291.6	5	26.7	3.7	152	40.7	291.5	9	44.3	3.4	142	16.7	291.2	13	39.2	3.1	131	29.0	290.8	17	2.7	2.5	120	12.3	290.4	19	45.2	1.9
20	177	46.9		0	58.5		167	41.5		5	30.4		157	32.2		9	47.8		147	7.8		13	42.3		136	19.8		17	5.2		125	2.7		19	47.1	
40	182	38.4		1	2.3		172	33.1		5	34.1		162	23.6		9	51.2		151	59.0		13	45.3		141	10.6		17	7.8		129	53.1		19	49.0	
7 0	187	30.0	291.6	1	6.2	3.8	177	24.7	291.6	5	37.8	3.7	167	15.1	291.4	9	54.6	3.4	156	50.2	291.2	13	48.4	3.0	146	1.4	290.8	17	10.3	2.5	134	43.4	290.4	19	50.9	1.9
20	192	21.6		1	10.0		182	16.3		5	41.5		172	6.5		9	58.0		161	41.4		13	51.4		150	52.2		17	12.9		139	33.8		19	52.8	
40	197	13.2		1	13.8		187	7.9		5	45.2		176	58.0		10	1.5		166	32.5		13	54.5		155	42.9		17	15.4		144	24.2		19	54.7	
8 0	202	4.7	291.6	1	17.7	3.8	191	59.5	291.6	5	48.9	3.7	181	49.4	291.4	10	4.9	3.4	171	23.7	291.2	13	57.5	3.0	160	33.7	290.8	17	17.9	2.5	149	14.5	290.3	19	56.6	1.8
20	206	56.3		1	21.5		196	51.1		5	52.5		186	40.9		10	8.3		176	14.8		14	0.5		165	24.5		17	20.4		154	4.9		19	58.4	
40	211	47.9		1	25.3		201	42.7		5	56.2		191	32.3		10	11.7		181	6.0		14	3.5		170	15.3		17	22.9		158	55.2		20	0.3	
9 0	216	39.4	291.6	1	29.2	3.8	206	34.2	291.6	5	59.9	3.7	196	23.7	291.4	10	15.1	3.4	185	57.1	291.1	14	6.6	3.0	175	6.0	290.8	17	25.4	2.5	163	45.6	290.3	20	2.1	1.8
20	221	31.0		1	33.0		211	25.8		6	3.5		201	15.2		10	18.5		190	48.3		14	9.6		179	56.8		17	27.9		168	35.9		20	4.0	
40	226	22.6		1	36.8		216	17.4		6	7.2		206	6.6		10	21.9		195	39.4		14	12.6		184	47.5		17	30.4		173	26.2		20	5.8	
10 0	231	14.2	291.6	1	40.7	3.8	221	9.0	291.6	6	10.9	3.6	210	58.0	291.4	10	25.3	3.4	200	30.5	291.1	14	15.6	3.0	189	38.3	290.7	17	32.8	2.5	178	16.6	290.3	20	7.6	1.8
20	236	5.8		1	44.5		226	0.6		6	14.5		215	49.4		10	28.7		205	21.7		14	18.5		194	29.0		17	35.3		183	6.9		20	9.4	
40	240	57.3		1	48.3		230	52.2		6	18.2		220	40.9		10	32.0		210	12.8		14	21.5		199	19.7		17	37.8		187	57.2		20	11.2	
11 0	245	48.9	291.6	1	52.1	3.8	235	43.7	291.6	6	21.8	3.7	225	32.3	291.4	10	35.4	3.4	215	3.9	291.1	14	24.5	3.0	204	10.5	290.7	17	40.2	2.4	192	47.5	290.3	20	13.0	1.8
20	250	40.5		1	55.9		240	35.3		6	25.5		230	23.7		10	38.8		219	55.0		14	27.5		209	1.2		17	42.7		197	37.8		20	14.7	
40	255	32.1		1	59.8		245	26.9		6	29.1		235	15.1		10	42.1		224	46.1		14	30.4		213	51.9		17	45.1		202	28.1		20	16.5	
12 0	260	23.7	291.6	2	3.6	3.8	250	18.5	291.6	6	32.8	3.6	240	6.5	291.4	10	45.5	3.3	229	37.2	291.1	14	33.4	2.9	218	42.6	290.7	17	47.5	2.4	207	18.4	290.3	20	18.3	1.7
20	265	15.3		2	7.4		255	10.0		6	36.4		244	57.9		10	48.9		234	28.3		14	36.3		223	33.3		17	49.9		212	8.7		20	20.0	
40	270	6.8		2	11.2		260	1.6		6	40.1		249	49.3		10	52.2		239	19.4		14	39.3		228	24.0		17	52.3		216	59.0		20	21.7	
13 0	274	58.4	291.6	2	15.0	3.8	264	53.2	291.6	6	43.7	3.6	254	40.7	291.4	10	55.5	3.4	244	10.5	291.1	14	42.2	2.9	233	14.7	290.7	17	54.7	2.4	221	49.2	290.3	20	23.5	1.7
20	279	50.0		2	18.8		269	44.7		6	47.3		259	32.1		10	58.9		249	1.6		14	45.1		238	5.4		17	57.1		226	39.5		20	25.2	
40	284	41.6		2	22.6		274	36.3		6	51.0		264	23.5		11	2.2		253	52.7		14	48.1		242	56.1		17	59.5		231	29.8		20	26.9	
14 0	289	33.2	291.6	2	26.4	3.8	279	27.9	291.6	6	54.6	3.6	269	14.8	291.4	11	5.6	3.3	258	43.7	291.1	14	51.0	2.9	247	46.8	290.7	18	1.9	2.3	236	20.0	290.2	20	28.6	1.7
20	294	24.8		2	30.3		284	19.4		6	58.2		274	6.2		11	8.9		263	34.8		14	53.9		252	37.4		18	4.2		241	10.3		20	30.2	
40	299	16.4		2	34.1		289	11.0		7	1.8		278	57.6		11	12.2		268	25.9		14	56.8		257	28.1		18	6.6		246	0.5		20	31.9	
15 0	304	8.0	291.6	2	37.9	3.8	294	2.6	291.6	7	5.4	3.6	283	49.0	291.4	11	15.5	3.3	273	16.9	291.0	14	59.7	2.9	262	18.8	290.6	18	8.9	2.3	250	50.7	290.2	20	33.6	1.6
20	308	59.6		2	41.7		298	54.1		7	9.1		288	40.3		11	18.8		278	8.0		15	2.6		267	9.4		18	11.3		255	41.0		20	35.2	
40	313	51.2		2	45.5		303	45.7		7	12.7		293	31.7		11	22.1		282	59.0		15	5.5		272	0.1		18	13.6		260	31.2		20	36.9	
16 0	318	42.8	291.6	2	49.3	3.8	308	37.2	291.6	7	16.3	3.6	298	23.1	291.4	11	25.4	3.3	287	50.0	291.0	15	8.3	2.9	276	50.7	290.6	18	15.9	2.3	265	21.4	290.2	20	38.5	1.6
20	323	34.4		2	53.0		313	28.8		7	19.9		303	14.4		11	28.7		292	41.1		15	11.2		281	41.3		18	18.2		270	11.7		20	40.1	
40	328	26.0		2	56.8		318	20.4		7	23.5		308	5.8		11	32.0		297	32.1		15	14.1		286	32.0		18	20.5		275	1.9		20	41.7	
17 0	333	17.6	291.6	3	0.6	3.8	323	11.9	291.5	7	27.1	3.6	312	57.1	291.3	11	35.3	3.3	302	23.1	291.0	15	16.9	2.9	291	22.6	290.6	18	22.8	2.3	279	52.1	290.2	20	43.3	1.6
20	338	9.2		3	4.4		328	3.5		7	30.7		317	48.5		11	38.6		307	14.2		15	19.8		296	13.2		18	25.1		284	42.3		20	44.9	
40	343	0.8		3	8.2		332	55.0		7	34.2		322	39.8		11	41.9		312	5.2		15	22.6		301	3.8		18	27.4		289	32.5		20	46.5	
18 0	347	52.4	291.6	3	12.0	3.8	337	46.6	291.5	7	37.8	3.6	327	31.2	291.3	11	45.1	3.3	316	56.2	291.0	15	25.5	2.8	305	54.4	290.6	18	29.6	2.3	294	22.7	290.2	20	48.1	1.5
20	352	44.0		3	15.8		342	38.1		7	41.4		332	22.5		11	48.4		321	47.2		15	28.3		310	45.0		18	31.9		299	12.8		20	49.6	
40	357	35.6		3	19.6		347	29.6		7	45.0		337	13.8		11	51.7		326	38.2		15	31.1		315	35.6		18	34.1		304	3.0		20	51.2	
19 0	2	27.1	291.6	3	23.3	3.8	352	21.2	291.5	7	48.6	3.6	342	5.2	291.3	11	54.9	3.2	331	29.2	291.0	15	33.9	2.8	320	26.2	290.6	18	36.4	2.2	308	53.2	290.2	20	52.7	1.5
20	7	18.8		3	27.1		357	12.7		7	52.1		346	56.5		11	58.2		336	20.2		15	36.7		325	16.8		18	38.6		313	43.4		20	54.2	
40	12	10.4		3	30.9		2	4.3		7	55.7		351	47.8		12	1.4		341	11.2		15	39.5		330	7.3		18	40.8		318	33.5		20	55.7	
20 0	17	2.0	291.6	3	34.7	3.8	6	55.8	291.5	7	59.3	3.5	356	39.1	291.3	12	4.6	3.2	346	2.1	291.0	15	42.3	2.8	334	57.9	290.6	18	43.1	2.2	323	23.7	290.1	20	57.2	1.5
20	21	53.6		3	38.4		11	47.3		8	2.8		1	30.4		12	7.9		350	53.1		15	45.1		339	48.5		18	45.3		328	13.8		20	58.7	
40	26	45.2		3	42.2		16	38.9		8	6.4		6	21.7		12	11.1		355	44.1		15	47.9		344	39.0		18	47.5		333	4.0		21	0.2	
21 0	31	36.8	291.6	3	46.0	3.7	21	30.4	291.5	8	9.9	3.6	11	13.0	291.3	12	14.3	3.2	0	35.0	291.0	15	50.6	2.8	349	29.6	290.5	18	49.6	2.2	337	54.1	290.1	21	1.7	1.4
20	36	28.4		3	49.7		26	21.9		8	13.5		16	4.3		12	17.5		5	26.0		15	53.4		354	20.1		18	51.8		342	44.2		21	3.1	
40	41	20.0		3	53.5		31	13.4		8	17.0		20	55.6		12	20.8		10	16.9		15	56.2		359	10.7		18	54.0		347	34.4		21	4.6	
22 0	46	11.6	291.6	3	57.2	3.8	36	5.0	291.5	8	20.6	3.5	25	46.9	291.3	12	24.0	3.2	15	7.9	290.9	15	58.9	2.7	4	1.2	290.5	18	56.1	2.2	352	24.5	290.1	21	6.0	1.4
20	51	3.2		4	1.0		40	56.5		8	24.1		30	38.2		12	27.2		19	58.8		16	1.7		8	51.7		18	58.3		357	14.6		21	7.4	
40	55	54.8		4	4.8		45	48.0		8	27.6		35	29.5		12	30.4		24	49.8		16	4.4		13	42.3		19	0.4		2	4.7		21	8.8	
23 0	60	46.4	291.6	4	8.5	3.7	50	39.5	291.5	8	31.2	3.5	40	20.8	291.3	12	33.6	3.2	29	40.7	290.9	16	7.1	2.7	18	32.8	290.5	19	2.6	2.1	6	54.8	290.1	21	10.2	1.4
20	65	38.0		4	12.3		55	31.0		8	34.7		45	12.1		12	36.7		34	31.6		16	9.8		23	23.3		19	4.7		11	44.9		21	11.6	
40	70	29.6		4	16.0		60	22.5		8	38.2		50	3.3		12	39.9		39	22.5		16	12.6		28	13.8		19	6.8		16	35.0		21	13.0	

2011 Moon

h m	9 Dec GHA	9 Dec Dec	d	10 Dec GHA	10 Dec Dec	d	11 Dec GHA	11 Dec Dec	d	12 Dec GHA	12 Dec Dec	d	13 Dec GHA	13 Dec Dec	d	14 Dec GHA	14 Dec Dec	d
0 0	21 25.1	21 14.4		9 19.3	22 22.7		356 55.1	22 27.0		344 24.5	21 24.1		331 59.1	19 15.5		319 46.9	16 7.0	
20	26 15.2	21 15.7	290.1 1.3	14 9.0	22 23.2	289.8 0.5	1 44.7	22 26.6	289.6 -0.4	349 14.1	21 22.8	289.6 -1.4	336 48.8	19 13.3	289.7 -2.2	324 36.8	16 4.0	289.9 -3.0
40	31 5.3	21 17.1		18 58.8	22 23.7		6 34.3	22 26.1		354 3.7	21 21.4		341 38.5	19 11.1		329 26.8	16 1.0	
1 0	35 55.4	21 18.4		23 48.5	22 24.2		11 23.9	22 25.7		358 53.3	21 20.0		346 28.3	19 8.8		334 16.7	15 58.0	
20	40 45.4	21 19.8	290.1 1.3	28 38.3	22 24.6	289.8 0.5	16 13.5	22 25.3	289.6 -0.5	3 42.9	21 18.7	289.6 -1.4	351 18.0	19 6.6	289.7 -2.3	339 6.7	15 55.0	290.0 -3.0
40	45 35.5	21 21.1		33 28.0	22 25.1		21 3.1	22 24.8		8 32.5	21 17.3		356 7.7	19 4.3		343 56.6	15 51.9	
2 0	50 25.6	21 22.4		38 17.8	22 25.6		25 52.7	22 24.3		13 22.1	21 15.9		0 57.5	19 2.0		348 46.6	15 48.9	
20	55 15.6	21 23.7	290.1 1.3	43 7.5	22 26.0	289.7 0.4	30 42.2	22 23.8	289.6 -0.5	18 11.7	21 14.4	289.6 -1.4	5 47.2	18 59.7	289.7 -2.3	353 36.6	15 45.8	290.0 -3.1
40	60 5.7	21 24.9		47 57.3	22 26.4		35 31.8	22 23.3		23 1.2	21 13.0		10 37.0	18 57.4		358 26.5	15 42.7	
3 0	64 55.7	21 26.2		52 47.0	22 26.8		40 21.4	22 22.8		27 50.8	21 11.6		15 26.7	18 55.1		3 16.5	15 39.7	
20	69 45.8	21 27.5	290.0 1.3	57 36.7	22 27.2	289.7 0.4	45 11.0	22 22.3	289.6 -0.5	32 40.4	21 10.1	289.6 -1.5	20 16.5	18 52.8	289.8 -2.3	8 6.5	15 36.6	290.0 -3.1
40	74 35.8	21 28.7		62 26.5	22 27.6		50 0.6	22 21.7		37 30.0	21 8.6		25 6.2	18 50.4		12 56.4	15 33.5	
4 0	79 25.8	21 30.0		67 16.2	22 28.0		54 50.1	22 21.2		42 19.6	21 7.1		29 56.0	18 48.1		17 46.4	15 30.4	
20	84 15.9	21 31.2	290.0 1.2	72 5.9	22 28.3	289.7 0.3	59 39.7	22 20.6	289.6 -0.6	47 9.2	21 5.6	289.6 -1.5	34 45.7	18 45.7	289.8 -2.4	22 36.4	15 27.3	290.0 -3.1
40	89 5.9	21 32.4		76 55.7	22 28.7		64 29.3	22 20.0		51 58.8	21 4.1		39 35.5	18 43.3		27 26.4	15 24.1	
5 0	93 55.9	21 33.6		81 45.4	22 29.0		69 18.9	22 19.4		56 48.5	21 2.6		44 25.3	18 40.9		32 16.4	15 21.0	
20	98 45.9	21 34.8	290.0 1.2	86 35.1	22 29.3	289.7 0.3	74 8.5	22 18.8	289.6 -0.6	61 38.1	21 1.1	289.6 -1.5	49 15.0	18 38.5	289.8 -2.4	37 6.4	15 17.9	290.0 -3.2
40	103 35.9	21 36.0		91 24.8	22 29.7		78 58.0	22 18.2		66 27.7	20 59.5		54 4.8	18 36.1		41 56.4	15 14.7	
6 0	108 25.9	21 37.1		96 14.5	22 30.0		83 47.6	22 17.6		71 17.3	20 58.0		58 54.6	18 33.7		46 46.4	15 11.5	
20	113 15.9	21 38.3	290.0 1.2	101 4.2	22 30.2	289.7 0.3	88 37.2	22 16.9	289.6 -0.7	76 6.9	20 56.4	289.6 -1.6	63 44.4	18 31.3	289.8 -2.4	51 36.4	15 8.4	290.0 -3.2
40	118 5.9	21 39.4		105 53.9	22 30.5		93 26.8	22 16.3		80 56.5	20 54.8		68 34.1	18 28.8		56 26.4	15 5.2	
7 0	122 55.9	21 40.6		110 43.6	22 30.8		98 16.3	22 15.6		85 46.1	20 53.2		73 23.9	18 26.4		61 16.4	15 2.0	
20	127 45.9	21 41.7	290.0 1.1	115 33.3	22 31.0	289.7 0.2	103 5.9	22 14.9	289.6 -0.7	90 35.7	20 51.6	289.6 -1.6	78 13.7	18 23.9	289.8 -2.5	66 6.4	14 58.8	290.0 -3.2
40	132 35.8	21 42.8		120 23.0	22 31.2		107 55.5	22 14.2		95 25.3	20 50.0		83 3.5	18 21.4		70 56.4	14 55.6	
8 0	137 25.8	21 43.9		125 12.7	22 31.5		112 45.0	22 13.5		100 15.0	20 48.4		87 53.3	18 19.0		75 46.4	14 52.4	
20	142 15.8	21 45.0	290.0 1.1	130 2.4	22 31.7	289.7 0.2	117 34.6	22 12.8	289.6 -0.7	105 4.6	20 46.7	289.6 -1.7	92 43.1	18 16.5	289.8 -2.5	80 36.4	14 49.2	290.0 -3.2
40	147 5.7	21 46.1		134 52.1	22 31.9		122 24.2	22 12.0		109 54.2	20 45.1		97 32.9	18 13.9		85 26.4	14 45.9	
9 0	151 55.7	21 47.1		139 41.8	22 32.1		127 13.8	22 11.3		114 43.8	20 43.4		102 22.7	18 11.4		90 16.5	14 42.7	
20	156 45.7	21 48.2	289.9 1.1	144 31.4	22 32.2	289.7 0.1	132 3.3	22 10.5	289.6 -0.8	119 33.5	20 41.7	289.6 -1.7	107 12.5	18 8.9	289.8 -2.5	95 6.5	14 39.4	290.0 -3.3
40	161 35.6	21 49.2		149 21.1	22 32.4		136 52.9	22 9.8		124 23.1	20 40.0		112 2.3	18 6.4		99 56.5	14 36.2	
10 0	166 25.5	21 50.3		154 10.8	22 32.5		141 42.5	22 9.0		129 12.7	20 38.3		116 52.1	18 3.8		104 46.6	14 32.9	
20	171 15.5	21 51.3	289.9 1.0	159 0.5	22 32.7	289.7 0.1	146 32.0	22 8.2	289.6 -0.8	134 2.3	20 36.6	289.6 -1.7	121 41.9	18 1.2	289.8 -2.6	109 36.6	14 29.6	290.0 -3.3
40	176 5.4	21 52.3		163 50.1	22 32.8		151 21.6	22 7.4		138 52.0	20 34.8		126 31.7	17 58.7		114 26.6	14 26.3	
11 0	180 55.3	21 53.3		168 39.8	22 32.9		156 11.2	22 6.5		143 41.6	20 33.1		131 21.5	17 56.1		119 16.7	14 23.0	
20	185 45.3	21 54.3	289.9 1.0	173 29.5	22 33.0	289.7 0.1	161 0.7	22 5.7	289.6 -0.8	148 31.2	20 31.3	289.6 -1.8	136 11.4	17 53.5	289.8 -2.6	124 6.7	14 19.7	290.0 -3.3
40	190 35.2	21 55.2		178 19.1	22 33.1		165 50.3	22 4.8		153 20.9	20 29.6		141 1.2	17 50.9		128 56.8	14 16.4	
12 0	195 25.1	21 56.2		183 8.8	22 33.1		170 39.9	22 4.0		158 10.5	20 27.8		145 51.0	17 48.3		133 46.8	14 13.1	
20	200 15.0	21 57.1	289.9 0.9	187 58.4	22 33.2	289.7 0.1	175 29.4	22 3.1	289.6 -0.9	163 0.2	20 26.0	289.6 -1.8	150 40.8	17 45.6	289.8 -2.7	138 36.9	14 9.7	290.1 -3.4
40	205 4.9	21 58.1		192 48.1	22 33.2		180 19.0	22 2.2		167 49.8	20 24.2		155 30.7	17 43.0		143 26.9	14 6.4	
13 0	209 54.8	21 59.0		197 37.7	22 33.3		185 8.6	22 1.3		172 39.5	20 22.4		160 20.5	17 40.3		148 17.0	14 3.0	
20	214 44.7	21 59.9	289.9 0.9	202 27.4	22 33.3	289.6 0.0	189 58.1	22 0.4	289.6 -0.9	177 29.1	20 20.5	289.7 -1.9	165 10.4	17 37.7	289.8 -2.7	153 7.1	13 59.7	290.1 -3.4
40	219 34.6	22 0.8		207 17.0	22 33.3		194 47.7	21 59.4		182 18.8	20 18.7		170 0.2	17 35.0		157 57.1	13 56.3	
14 0	224 24.5	22 1.7		212 6.7	22 33.3		199 37.3	21 58.5		187 8.4	20 16.8		174 50.1	17 32.3		162 47.2	13 52.9	
20	229 14.4	22 2.6	289.9 0.9	216 56.3	22 33.2	289.6 0.0	204 26.8	21 57.5	289.6 -1.0	191 58.1	20 14.9	289.7 -1.9	179 39.9	17 29.6	289.9 -2.7	167 37.3	13 49.6	290.1 -3.4
40	234 4.3	22 3.4		221 46.0	22 33.2		209 16.4	21 56.6		196 47.7	20 13.1		184 29.8	17 26.9		172 27.3	13 46.2	
15 0	238 54.1	22 4.3		226 35.6	22 33.2		214 6.0	21 55.6		201 37.4	20 11.2		189 19.6	17 24.2		177 17.4	13 42.8	
20	243 44.0	22 5.1	289.9 0.8	231 25.2	22 33.1	289.6 -0.1	218 55.5	21 54.6	289.6 -1.0	206 27.0	20 9.3	289.7 -1.9	194 9.5	17 21.5	289.9 -2.7	182 7.5	13 39.3	290.1 -3.4
40	248 33.9	22 5.9		236 14.9	22 33.0		223 45.1	21 53.6		211 16.7	20 7.4		198 59.3	17 18.7		186 57.6	13 35.9	
16 0	253 23.8	22 6.8		241 4.5	22 32.9		228 34.7	21 52.5		216 6.4	20 5.4		203 49.2	17 16.0		191 47.7	13 32.5	
20	258 13.6	22 7.6	289.9 0.8	245 54.1	22 32.8	289.6 -0.1	233 24.3	21 51.5	289.6 -1.0	220 56.0	20 3.5	289.7 -1.9	208 39.1	17 13.2	289.9 -2.8	196 37.7	13 29.1	290.1 -3.4
40	263 3.5	22 8.3		250 43.8	22 32.7		238 13.8	21 50.5		225 45.7	20 1.5		213 28.9	17 10.5		201 27.8	13 25.6	
17 0	267 53.3	22 9.1		255 33.4	22 32.6		243 3.4	21 49.4		230 35.4	19 59.6		218 18.8	17 7.7		206 17.9	13 22.2	
20	272 43.2	22 9.9	289.8 0.8	260 23.0	22 32.5	289.6 -0.2	247 53.0	21 48.3	289.6 -1.1	235 25.1	19 57.6	289.7 -2.0	223 8.7	17 4.9	289.9 -2.8	211 8.0	13 18.7	290.1 -3.5
40	277 33.0	22 10.7		265 12.6	22 32.3		252 42.5	21 47.2		240 14.7	19 55.6		227 58.6	17 2.1		215 58.1	13 15.2	
18 0	282 22.8	22 11.4		270 2.3	22 32.1		257 32.1	21 46.1		245 4.4	19 53.6		232 48.4	16 59.3		220 48.2	13 11.8	
20	287 12.7	22 12.1	289.8 0.7	274 51.9	22 32.0	289.6 -0.2	262 21.7	21 45.0	289.6 -1.1	249 54.1	19 51.6	289.7 -2.0	237 38.3	16 56.5	289.9 -2.8	225 38.3	13 8.3	290.1 -3.5
40	292 2.5	22 12.8		279 41.5	22 31.8		267 11.3	21 43.9		254 43.8	19 49.6		242 28.2	16 53.7		230 28.4	13 4.8	
19 0	296 52.3	22 13.6		284 31.1	22 31.6		272 0.8	21 42.8		259 33.5	19 47.5		247 18.1	16 50.8		235 18.6	13 1.3	
20	301 42.2	22 14.2	289.8 0.7	289 20.7	22 31.4	289.6 -0.2	276 50.4	21 41.6	289.6 -1.2	264 23.2	19 45.5	289.7 -2.1	252 8.0	16 48.0	289.9 -2.9	240 8.7	12 57.8	290.1 -3.5
40	306 32.0	22 14.9		294 10.3	22 31.1		281 40.0	21 40.4		269 12.8	19 43.4		256 57.9	16 45.1		244 58.8	12 54.2	
20 0	311 21.8	22 15.6		298 59.9	22 30.9		286 29.6	21 39.3		274 2.5	19 41.3		261 47.8	16 42.2		249 48.9	12 50.7	
20	316 11.6	22 16.3	289.8 0.6	303 49.6	22 30.6	289.6 -0.3	291 19.1	21 38.1	289.6 -1.2	278 52.2	19 39.2	289.7 -2.1	266 37.7	16 39.4	289.9 -2.9	254 39.0	12 47.2	290.1 -3.5
40	321 1.4	22 16.9		308 39.2	22 30.4		296 8.7	21 36.9		283 41.9	19 37.1		271 27.6	16 36.5		259 29.1	12 43.6	
21 0	325 51.2	22 17.5		313 28.8	22 30.1		300 58.3	21 35.6		288 31.6	19 35.0		276 17.5	16 33.6		264 19.3	12 40.1	
20	330 41.0	22 18.2	289.8 0.6	318 18.4	22 29.8	289.6 -0.3	305 47.9	21 34.4	289.6 -1.2	293 21.3	19 32.9	289.7 -2.1	281 7.5	16 30.7	289.9 -2.9	269 9.4	12 36.5	290.1 -3.6
40	335 30.8	22 18.8		323 8.0	22 29.5		310 37.4	21 33.2		298 11.0	19 30.8		285 57.4	16 27.7		273 59.5	12 33.0	
22 0	340 20.6	22 19.4		327 57.6	22 29.2		315 27.0	21 31.9		303 0.8	19 28.6		290 47.3	16 24.8		278 49.7	12 29.4	
20	345 10.4	22 19.9	289.8 0.6	332 47.2	22 28.8	289.6 -0.4	320 16.6	21 30.6	289.6 -1.3	307 50.5	19 26.5	289.7 -2.2	295 37.2	16 21.9	289.9 -2.9	283 39.8	12 25.8	290.1 -3.6
40	350 0.2	22 20.5		337 36.8	22 28.5		325 6.2	21 29.4		312 40.2	19 24.3		300 27.2	16 18.9		288 29.9	12 22.2	
23 0	354 49.9	22 21.1		342 26.4	22 28.1		329 55.8	21 28.1		317 29.9	19 22.1		305 17.1	16 16.0		293 20.1	12 18.6	
20	359 39.7	22 21.6	289.8 0.5	347 16.0	22 27.8	289.6 -0.4	334 45.4	21 26.8	289.6 -1.3	322 19.6	19 19.9	289.7 -2.2	310 7.0	16 13.0	289.9 -3.0	298 10.2	12 15.0	290.1 -3.6
40	4 29.5	22 22.2		352 5.5	22 27.4		339 34.9	21 25.5		327 9.3	19 17.7		314 57.0	16 10.0		303 0.4	12 11.4	

2011 Moon

	15 Dec							16 Dec							17 Dec							18 Dec							19 Dec							20 Dec						
	GHA			Dec				GHA			Dec				GHA			Dec				GHA			Dec				GHA			Dec				GHA			Dec			
h m	°	'	d	°	'	d	'	°	'	d	°	'	d	'	°	'	d	°	'	d	'	°	'	d	°	'	d	'	°	'	d	°	'	d	'	°	'	d	°	'	d	'
0 0	307	50.5	290.2	12	7.8	-3.6		296	6.7	290.3	7	29.3	-4.1		284	27.0	290.3	2	24.4	-4.4		272	40.2	290.1	-2	52.7	-4.4		260	33.0	289.7	-8	6.3	-4.3		247	52.9	289.2	-12	58.7	-3.8	
20	312	40.7		12	4.2			300	56.9		7	25.2			289	17.3		2	20.1			277	30.3		-2	57.1			265	22.7		-8	10.6			252	42.1		-13	2.5		
40	317	30.8		12	0.5			305	47.2		7	21.1			294	7.6		2	15.7			282	20.3		-3	1.5			270	12.4		-8	14.8			257	31.2		-13	6.3		
1 0	322	21.0	290.2	11	56.9	-3.7		310	37.5	290.3	7	17.0	-4.1		298	57.8	290.3	2	11.3	-4.3		287	10.4	290.1	-3	6.0	-4.4		275	2.0	289.7	-8	19.1	-4.2		262	20.4	289.1	-13	10.1	-3.8	
20	327	11.2		11	53.2			315	27.8		7	12.9			303	48.1		2	7.0			292	0.4		-3	10.4			279	51.7		-8	23.3			267	9.5		-13	13.9		
40	332	1.3		11	49.6			320	18.0		7	8.8			308	38.3		2	2.6			296	50.5		-3	14.8			284	41.4		-8	27.6			271	58.7		-13	17.7		
2 0	336	51.5	290.2	11	45.9	-3.7		325	8.3	290.3	7	4.7	-4.1		313	28.6	290.3	1	58.3	-4.4		301	40.6	290.0	-3	19.2	-4.4		289	31.0	289.7	-8	31.8	-4.2		276	47.8	289.1	-13	21.5	-3.7	
20	341	41.7		11	42.2			329	58.6		7	0.6			318	18.8		1	53.9			306	30.6		-3	23.6			294	20.7		-8	36.0			281	36.9		-13	25.2		
40	346	31.8		11	38.6			334	48.9		6	56.5			323	9.1		1	49.5			311	20.6		-3	28.0			299	10.4		-8	40.2			286	26.0		-13	29.0		
3 0	351	22.0	290.2	11	34.9	-3.7		339	39.2	290.3	6	52.4	-4.2		327	59.3	290.2	1	45.1	-4.4		316	10.7	290.0	-3	32.5	-4.4		303	60.0	289.6	-8	44.4	-4.2		291	15.1	289.1	-13	32.7	-3.7	
20	356	12.2		11	31.2			344	29.5		6	48.2			332	49.6		1	40.8			321	0.7		-3	36.9			308	49.6		-8	48.7			296	4.2		-13	36.5		
40	1	2.3		11	27.5			349	19.7		6	44.1			337	39.8		1	36.4			325	50.7		-3	41.3			313	39.3		-8	52.9			300	53.3		-13	40.2		
4 0	5	52.5	290.2	11	23.8	-3.7		354	10.0	290.3	6	39.9	-4.1		342	30.1	290.2	1	32.0	-4.4		330	40.8	290.0	-3	45.7	-4.4		318	28.9	289.6	-8	57.1	-4.2		305	42.4	289.1	-13	43.9	-3.7	
20	10	42.7		11	20.1			359	0.3		6	35.8			347	20.3		1	27.6			335	30.8		-3	50.1			323	18.5		-9	1.3			310	31.4		-13	47.7		
40	15	32.9		11	16.3			3	50.6		6	31.7			352	10.6		1	23.2			340	20.8		-3	54.5			328	8.1		-9	5.4			315	20.5		-13	51.4		
5 0	20	23.1	290.2	11	12.6	-3.7		8	40.9	290.3	6	27.5	-4.2		357	0.8	290.2	1	18.9	-4.4		345	10.8	290.0	-3	58.9	-4.4		332	57.7	289.6	-9	9.6	-4.2		320	9.5	289.0	-13	55.1	-3.7	
20	25	13.3		11	8.9			13	31.2		6	23.3			1	51.0		1	14.5			350	0.8		-4	3.3			337	47.3		-9	13.8			324	58.6		-13	58.8		
40	30	3.5		11	5.1			18	21.5		6	19.2			6	41.3		1	10.1			354	50.8		-4	7.7			342	36.9		-9	18.0			329	47.6		-14	2.4		
6 0	34	53.6	290.2	11	1.4	-3.8		23	11.8	290.3	6	15.0	-4.2		11	31.5	290.2	1	5.7	-4.4		359	40.8	290.0	-4	12.1	-4.4		347	26.5	289.6	-9	22.2	-4.2		334	36.6	289.0	-14	6.1	-3.7	
20	39	43.8		10	57.6			28	2.0		6	10.8			16	21.7		1	1.3			4	30.8		-4	16.5			352	16.0		-9	26.3			339	25.6		-14	9.8		
40	44	34.0		10	53.8			32	52.3		6	6.7			21	12.0		0	56.9			9	20.8		-4	20.9			357	5.6		-9	30.5			344	14.6		-14	13.4		
7 0	49	24.2	290.2	10	50.1	-3.8		37	42.6	290.3	6	2.5	-4.2		26	2.2	290.2	0	52.5	-4.4		14	10.8	290.0	-4	25.3	-4.4		1	55.2	289.5	-9	34.7	-4.1		349	3.6	289.0	-14	17.1	-3.6	
20	54	14.4		10	46.3			42	32.9		5	58.3			30	52.4		0	48.1			19	0.8		-4	29.7			6	44.7		-9	38.8			353	52.6		-14	20.7		
40	59	4.6		10	42.5			47	23.2		5	54.1			35	42.6		0	43.7			23	50.7		-4	34.1			11	34.3		-9	43.0			358	41.6		-14	24.4		
8 0	63	54.8	290.2	10	38.7	-3.8		52	13.5	290.3	5	49.9	-4.2		40	32.9	290.2	0	39.3	-4.4		28	40.7	290.0	-4	38.5	-4.4		16	23.8	289.5	-9	47.1	-4.1		3	30.6	289.0	-14	28.0	-3.6	
20	68	45.0		10	34.9			57	3.8		5	45.7			45	23.1		0	34.9			33	30.7		-4	42.9			21	13.3		-9	51.2			8	19.6		-14	31.6		
40	73	35.3		10	31.1			61	54.1		5	41.5			50	13.3		0	30.5			38	20.6		-4	47.3			26	2.9		-9	55.4			13	8.5		-14	35.2		
9 0	78	25.5	290.2	10	27.3	-3.8		66	44.4	290.3	5	37.3	-4.2		55	3.5	290.2	0	26.1	-4.4		43	10.6	289.9	-4	51.6	-4.4		30	52.4	289.5	-9	59.5	-4.1		17	57.5	288.9	-14	38.8	-3.6	
20	83	15.7		10	23.5			71	34.7		5	33.1			59	53.7		0	21.7			48	0.5		-4	56.0			35	41.9		-10	3.6			22	46.4		-14	42.4		
40	88	5.9		10	19.6			76	24.9		5	28.9			64	43.9		0	17.3			52	50.5		-5	0.4			40	31.4		-10	7.7			27	35.3		-14	45.9		
10 0	92	56.1	290.2	10	15.8	-3.8		81	15.2	290.3	5	24.7	-4.2		69	34.1	290.2	0	12.9	-4.4		57	40.4	289.9	-5	4.8	-4.4		45	20.9	289.5	-10	11.8	-4.1		32	24.3	288.9	-14	49.5	-3.5	
20	97	46.3		10	12.0			86	5.5		5	20.5			74	24.3		0	8.5			62	30.4		-5	9.2			50	10.4		-10	15.9			37	13.2		-14	53.1		
40	102	36.5		10	8.1			90	55.8		5	16.2			79	14.5		0	4.1			67	20.3		-5	13.5			54	59.9		-10	20.0			42	2.1		-14	56.6		
11 0	107	26.8	290.2	10	4.3	-3.9		95	46.1	290.3	5	12.0	-4.2		84	4.7	290.2	-0	0.3	-4.4		72	10.2	289.9	-5	17.9	-4.4		59	49.4	289.5	-10	24.1	-4.1		46	51.0	288.9	-15	0.1	-3.5	
20	112	17.0		10	0.4			100	36.4		5	7.8			88	54.9		-0	4.7			77	0.1		-5	22.3			64	38.8		-10	28.2			51	39.9		-15	3.7		
40	117	7.2		9	56.5			105	26.7		5	3.5			93	45.1		-0	9.1			81	50.0		-5	26.7			69	28.3		-10	32.3			56	28.7		-15	7.2		
12 0	121	57.4	290.2	9	52.7	-3.9		110	17.0	290.3	4	59.3	-4.2		98	35.3	290.2	-0	13.6	-4.4		86	40.0	289.9	-5	31.0	-4.4		74	17.7	289.4	-10	36.4	-4.1		61	17.6	288.9	-15	10.7	-3.5	
20	126	47.7		9	48.8			115	7.3		4	55.1			103	25.5		-0	18.0			91	29.9		-5	35.4			79	7.2		-10	40.4			66	6.5		-15	14.2		
40	131	37.9		9	44.9			119	57.6		4	50.8			108	15.7		-0	22.4			96	19.8		-5	39.8			83	56.6		-10	44.5			70	55.3		-15	17.7		
13 0	136	28.1	290.2	9	41.0	-3.9		124	47.8	290.3	4	46.6	-4.3		113	5.9	290.2	-0	26.8	-4.4		101	9.7	289.9	-5	44.1	-4.4		88	46.0	289.4	-10	48.6	-4.0		75	44.2	288.8	-15	21.1	-3.5	
20	141	18.4		9	37.1			129	38.1		4	42.3			117	56.1		-0	31.2			105	59.5		-5	48.5			93	35.5		-10	52.6			80	33.0		-15	24.6		
40	146	8.6		9	33.2			134	28.4		4	38.0			122	46.2		-0	35.6			110	49.4		-5	52.8			98	24.9		-10	56.7			85	21.8		-15	28.1		
14 0	150	58.9	290.2	9	29.3	-3.9		139	18.7	290.3	4	33.8	-4.3		127	36.4	290.2	-0	40.1	-4.4		115	39.3	289.9	-5	57.2	-4.3		103	14.3	289.4	-11	0.7	-4.0		90	10.7	288.8	-15	31.5	-3.4	
20	155	49.1		9	25.4			144	9.0		4	29.5			132	26.6		-0	44.5			120	29.2		-6	1.5			108	3.7		-11	4.7			94	59.5		-15	34.9		
40	160	39.3		9	21.5			148	59.3		4	25.2			137	16.8		-0	48.9			125	19.0		-6	5.9			112	53.1		-11	8.7			99	48.3		-15	38.4		
15 0	165	29.6	290.2	9	17.5	-3.9		153	49.6	290.3	4	21.0	-4.3		142	6.9	290.2	-0	53.3	-4.4		130	8.9	289.9	-6	10.2	-4.3		117	42.5	289.4	-11	12.8	-4.0		104	37.1	288.8	-15	41.8	-3.4	
20	170	19.8		9	13.6			158	39.9		4	16.7			146	57.1		-0	57.7			134	58.8		-6	14.6			122	31.8		-11	16.8			109	25.9		-15	45.2		
40	175	10.1		9	9.7			163	30.1		4	12.4			151	47.3		-1	2.2			139	48.6		-6	18.9			127	21.2		-11	20.8			114	14.6		-15	48.6		
16 0	180	0.3	290.2	9	5.7	-4.0		168	20.4	290.3	4	8.1	-4.3		156	37.4	290.2	-1	6.6	-4.4		144	38.5	289.8	-6	23.2	-4.3		132	10.6	289.3	-11	24.8	-4.0		119	3.4	288.8	-15	52.0	-3.3	
20	184	50.6		9	1.8			173	10.7		4	3.8			161	27.6		-1	11.0			149	28.3		-6	27.6			136	59.9		-11	28.8			123	52.2		-15	55.3		
40	189	40.8		8	57.8			178	1.0		3	59.6			166	17.7		-1	15.4			154	18.1		-6	31.9			141	49.3		-11	32.8			128	40.9		-15	58.7		
17 0	194	31.1	290.3	8	53.8	-4.0		182	51.3	290.3	3	55.3	-4.3		171	7.9	290.1	-1	19.8	-4.4		159	8.0	289.8	-6	36.2	-4.3		146	38.6	289.3	-11	36.7	-4.0		133	29.7	288.7	-16	2.0	-3.3	
20	199	21.3		8	49.9			187	41.6		3	51.0			175	58.0		-1	24.3			163	57.8		-6	40.6			151	28.0		-11	40.7			138	18.4		-16	5.4		
40	204	11.6		8	45.9			192	31.9		3	46.7			180	48.2		-1	28.7			168	47.6		-6	44.9			156	17.3		-11	44.7			143	7.1		-16	8.7		
18 0	209	1.8	290.3	8	41.9	-4.0		197	22.1	290.3	3	42.4	-4.3		185	38.3	290.1	-1	33.1	-4.4		173	37.4	289.8	-6	49.2	-4.3		161	6.6	289.3	-11	48.6	-4.0		147	55.9	288.7	-16	12.0	-3.3	
20	213	52.1		8	37.9			202	12.4		3	38.1			190	28.4		-1	37.5			178	27.2		-6	53.5			165	55.9		-11	52.6			152	44.6		-16	15.3		
40	218	42.3		8	33.9			207	2.7		3	33.7			195	18.6		-1	42.0			183	17.0		-6	57.8			170	45.2		-11	56.5			157	33.3		-16	18.6		
19 0	223	32.6	290.3	8	29.9	-4.0		211	53.0	290.3	3	29.4	-4.3		200	8.7	290.1	-1	46.4	-4.4		188	6.8	289.8	-7	2.1	-4.3		175	34.5	289.3	-12	0.5	-3.9		162	22.0	288.7	-16	21.9	-3.3	
20	228	22.9		8	25.9			216	43.3		3	25.1			204	58.8		-1	50.8			192	56.6		-7	6.4			180	23.8		-12	4.4			167	10.6		-16	25.2		
40	233	13.1		8	21.9			221	33.5		3	20.8			209	48.9		-1	55.2			197	46.4		-7	10.7			185	13.1		-12	8.3			171	59.3		-16	28.4		
20 0	238	3.4	290.3	8	17.9	-4.0		226	23.8	290.3	3	16.5	-4.3		214	39.1	290.1	-1	59.7	-4.4		202	36.1	289.8	-7	15.0	-4.3		190	2.3	289.3	-12	12.2	-3.9		176	48.0	288.7	-16	31.7	-3.2	
20	242	53.7		8	13.9			231	14.1		3	12.2			219	29.2		-2	4.1			207	25.9		-7	19.3			194	51.6		-12	16.2			181	36.6		-16	34.9		
40	247	43.9		8	9.9			236	4.4		3	7.8			224	19.3		-2	8.5			212	15.7		-7	23.6			199	40.8		-12	20.1			186	25.3		-16	38.2		
21 0	252	34.2	290.3	8	5.8	-4.0		240	54.6	290.3	3	3.5	-4.3		229	9.4	290.1	-2	12.9	-4.4		217	5.4	289.7	-7	27.9	-4.3		204	30.1	289.2	-12	24.0	-3.9		191	13.9	288.6	-16	41.4	-3.2	
20	257	24.5		8	1.8			245	44.9		2	59.2			233	59.5		-2	17.3			221	55.2		-7	32.2			209	19.3		-12	27.8			196	2.6		-16	44.6		
40	262	14.7		7	57.7			250	35.2		2	54.8			238	49.6		-2	21.8			226	44.9		-7	36.5			214	8.5		-12	31.7			200	51.2		-16	47.8		
22 0	267	5.0	290.3	7	53.7	-4.1		255	25.4	290.3	2	50.5	-4.3		243	39.7	290.1	-2	26.2	-4.4		231	34.7	289.7	-7	40.8	-4.3		218	57.8	289.2	-12	35.6	-3.9		205	39.8	288.6	-16	51.0	-3.1	
20	271	55.3		7	49.6			260	15.7		2	46.2			248	29.8		-2	30.6			236	24.4		-7	45.0			223	47.0		-12	39.5			210	28.4		-16	54.1		
40	276	45.6		7	45.6			265	6.0		2	41.8			253	19.9		-2	35.0			241	14.1		-7	49.3			228	36.2		-12	43.3			215	17.0		-16	57.3		
23 0	281	35.8	290.3	7	41.5	-4.1		269	56.3	290.3	2	37.5	-4.4		258	10.0	290.1	-2	39.5	-4.4		246	3.9	289.7	-7	53.6	-4.2		233	25.4	289.2	-12	47.2	-3.8		220	5.6	288.6	-17	0.4	-3.1	
20	286	26.1		7	37.4			274	46.5		2	33.1			263	0.0		-2	43.9			250	53.6		-7	57.8			238	14.6		-12	51.0			224	54.2		-17	3.6		
40	291	16.4		7	33.4			279	36.8		2	28.8			267	50.1		-2	48.3			255	43.3		-8	2.1			243	3.8		-12	54.8			229	42.8		-17	6.7		

2011 Moon

h m	21 Dec GHA ° ′	d	Dec ° ′	d′	22 Dec GHA ° ′	d	Dec ° ′	d′	23 Dec GHA ° ′	d	Dec ° ′	d′	24 Dec GHA ° ′	d	Dec ° ′	d′	25 Dec GHA ° ′	d	Dec ° ′	d′	26 Dec GHA ° ′	d	Dec ° ′	d′
0 0	234 31.3	288.6	-17 9.8	-3.1	220 27.4	288.0	-20 19.3	-2.1	205 51.9	287.7	-22 9.4	-0.9	191 6.8	287.8	-22 29.7	0.4	176 39.3	288.2	-21 20.5	1.6	162 52.3	288.9	-18 52.6	2.5
20	239 19.9		-17 12.9		225 15.5		-20 21.4		210 39.6		-22 10.3		195 54.5		-22 29.3		181 27.5		-21 18.9		167 41.2		-18 50.1	
40	244 8.5		-17 16.0		230 3.5		-20 23.5		215 27.3		-22 11.2		200 42.3		-22 29.0		186 15.7		-21 17.4		172 30.1		-18 47.6	
1 0	248 57.0	288.5	-17 19.1	-3.0	234 51.5	288.0	-20 25.6	-2.0	220 15.0	287.7	-22 12.1	-0.8	205 30.1	287.8	-22 28.6	0.4	191 3.9	288.2	-21 15.8	1.6	177 19.0	288.9	-18 45.0	2.6
20	253 45.5		-17 22.1		239 39.5		-20 27.7		225 2.7		-22 13.0		210 17.9		-22 28.1		195 52.1		-21 14.2		182 7.9		-18 42.5	
40	258 34.1		-17 25.2		244 27.5		-20 29.7		229 50.4		-22 13.8		215 5.7		-22 27.7		200 40.3		-21 12.6		186 56.8		-18 39.9	
2 0	263 22.6	288.5	-17 28.2	-3.0	249 15.4	288.0	-20 31.7	-2.0	234 38.1	287.7	-22 14.6	-0.8	219 53.4	287.8	-22 27.3	0.5	205 28.6	288.3	-21 10.9	1.6	191 45.7	288.9	-18 37.3	2.6
20	268 11.1		-17 31.3		254 3.4		-20 33.7		239 25.8		-22 15.4		224 41.2		-22 26.8		210 16.8		-21 9.3		196 34.6		-18 34.7	
40	272 59.6		-17 34.3		258 51.4		-20 35.7		244 13.5		-22 16.2		229 29.0		-22 26.3		215 5.1		-21 7.6		201 23.6		-18 32.1	
3 0	277 48.1	288.5	-17 37.3	-3.0	263 39.4	288.0	-20 37.7	-2.0	249 1.2	287.7	-22 17.0	-0.7	234 16.8	287.8	-22 25.8	0.5	219 53.3	288.3	-21 6.0	1.7	206 12.5	289.0	-18 29.5	2.7
20	282 36.6		-17 40.3		268 27.3		-20 39.7		253 48.9		-22 17.7		239 4.6		-22 25.3		224 41.6		-21 4.3		211 1.5		-18 26.8	
40	287 25.0		-17 43.2		273 15.3		-20 41.6		258 36.6		-22 18.5		243 52.4		-22 24.8		229 29.9		-21 2.6		215 50.5		-18 24.2	
4 0	292 13.5	288.5	-17 46.2	-2.9	278 3.2	287.9	-20 43.6	-1.9	263 24.3	287.7	-22 19.2	-0.7	248 40.2	287.8	-22 24.2	0.6	234 18.2	288.3	-21 0.9	1.8	220 39.5	289.0	-18 21.5	2.7
20	297 2.0		-17 49.2		282 51.2		-20 45.5		268 12.0		-22 19.9		253 28.1		-22 23.6		239 6.4		-20 59.1		225 28.5		-18 18.9	
40	301 50.4		-17 52.1		287 39.1		-20 47.4		272 59.7		-22 20.6		258 15.9		-22 23.0		243 54.7		-20 57.4		230 17.5		-18 16.2	
5 0	306 38.8	288.4	-17 55.0	-2.9	292 27.1	287.9	-20 49.3	-1.9	277 47.4	287.7	-22 21.2	-0.6	263 3.7	287.8	-22 22.4	0.6	248 43.1	288.3	-20 55.6	1.8	235 6.5	289.0	-18 13.5	2.7
20	311 27.3		-17 57.9		297 15.0		-20 51.2		282 35.1		-22 21.9		267 51.5		-22 21.8		253 31.4		-20 53.9		239 55.5		-18 10.8	
40	316 15.7		-18 0.9		302 2.9		-20 53.0		287 22.8		-22 22.5		272 39.4		-22 21.2		258 19.7		-20 52.1		244 44.6		-18 8.1	
6 0	321 4.1	288.4	-18 3.7	-2.9	306 50.8	287.9	-20 54.9	-1.8	292 10.5	287.7	-22 23.1	-0.6	277 27.2	287.8	-22 20.5	0.7	263 8.0	288.4	-20 50.3	1.8	249 33.6	289.1	-18 5.4	2.7
20	325 52.5		-18 6.6		311 38.7		-20 56.7		296 58.2		-22 23.7		282 15.1		-22 19.8		267 56.4		-20 48.5		254 22.7		-18 2.7	
40	330 40.9		-18 9.5		316 26.6		-20 58.5		301 45.8		-22 24.3		287 2.9		-22 19.2		272 44.8		-20 46.6		259 11.7		-17 59.9	
7 0	335 29.3	288.4	-18 12.3	-2.8	321 14.5	287.9	-21 0.3	-1.7	306 33.5	287.7	-22 24.8	-0.5	291 50.8	287.9	-22 18.4	0.7	277 33.1	288.4	-20 44.8	1.9	264 0.8	289.1	-17 57.2	2.8
20	340 17.7		-18 15.2		326 2.4		-21 2.0		311 21.2		-22 25.4		296 38.6		-22 17.7		282 21.5		-20 42.9		268 49.9		-17 54.4	
40	345 6.1		-18 18.0		330 50.3		-21 3.8		316 8.9		-22 25.9		301 26.5		-22 17.0		287 9.9		-20 41.0		273 39.0		-17 51.6	
8 0	349 54.5	288.4	-18 20.8	-2.8	335 38.2	287.9	-21 5.5	-1.7	320 56.6	287.7	-22 26.4	-0.5	306 14.3	287.9	-22 16.2	0.8	291 58.3	288.4	-20 39.1	1.9	278 28.1	289.1	-17 48.8	2.8
20	354 42.8		-18 23.6		340 26.1		-21 7.3		325 44.3		-22 26.9		311 2.2		-22 15.4		296 46.7		-20 37.2		283 17.3		-17 46.0	
40	359 31.2		-18 26.4		345 14.0		-21 9.0		330 32.0		-22 27.3		315 50.1		-22 14.7		301 35.1		-20 35.3		288 6.4		-17 43.2	
9 0	4 19.5	288.3	-18 29.2	-2.7	350 1.8	287.9	-21 10.7	-1.7	335 19.7	287.7	-22 27.8	-0.4	320 38.0	287.9	-22 13.8	0.8	306 23.5	288.4	-20 33.4	2.0	292 55.5	289.2	-17 40.4	2.8
20	9 7.9		-18 31.9		354 49.7		-21 12.4		340 7.3		-22 28.2		325 25.9		-22 13.0		311 11.9		-20 31.4		297 44.7		-17 37.6	
40	13 56.2		-18 34.7		359 37.6		-21 14.0		344 55.0		-22 28.6		330 13.8		-22 12.2		316 0.4		-20 29.5		302 33.9		-17 34.8	
10 0	18 44.5	288.3	-18 37.4	-2.7	4 25.4	287.8	-21 15.7	-1.6	349 42.7	287.7	-22 29.0	-0.4	335 1.7	287.9	-22 11.3	0.9	320 48.8	288.5	-20 27.5	2.0	307 23.0	289.2	-17 31.9	2.9
20	23 32.8		-18 40.1		9 13.3		-21 17.3		354 30.4		-22 29.4		339 49.6		-22 10.4		325 37.3		-20 25.5		312 12.2		-17 29.1	
40	28 21.2		-18 42.8		14 1.1		-21 18.9		359 18.1		-22 29.8		344 37.5		-22 9.5		330 25.7		-20 23.5		317 1.4		-17 26.2	
11 0	33 9.5	288.3	-18 45.5	-2.7	18 49.0	287.8	-21 20.5	-1.6	4 5.8	287.7	-22 30.1	-0.3	349 25.4	287.9	-22 8.6	0.9	335 14.2	288.5	-20 21.5	2.0	321 50.6	289.2	-17 23.3	2.9
20	37 57.7		-18 48.2		23 36.8		-21 22.1		8 53.5		-22 30.4		354 13.3		-22 7.7		340 2.7		-20 19.5		326 39.8		-17 20.4	
40	42 46.0		-18 50.8		28 24.6		-21 23.6		13 41.2		-22 30.7		359 1.2		-22 6.8		344 51.2		-20 17.4		331 29.1		-17 17.5	
12 0	47 34.3	288.3	-18 53.5	-2.6	33 12.5	287.8	-21 25.2	-1.5	18 28.8	287.7	-22 31.0	-0.3	3 49.2	287.9	-22 5.8	1.0	349 39.7	288.5	-20 15.4	2.1	336 18.3	289.3	-17 14.6	2.9
20	52 22.6		-18 56.1		38 0.3		-21 26.7		23 16.5		-22 31.3		8 37.1		-22 4.8		354 28.2		-20 13.3		341 7.6		-17 11.7	
40	57 10.8		-18 58.8		42 48.1		-21 28.2		28 4.2		-22 31.6		13 25.1		-22 3.8		359 16.7		-20 11.2		345 56.8		-17 8.8	
13 0	61 59.1	288.2	-19 1.4	-2.6	47 35.9	287.8	-21 29.7	-1.5	32 51.9	287.7	-22 31.8	-0.2	18 13.0	288.0	-22 2.8	1.0	4 5.3	288.5	-20 9.1	2.1	350 46.1	289.3	-17 5.8	2.9
20	66 47.3		-19 4.0		52 23.7		-21 31.2		37 39.6		-22 32.0		23 1.0		-22 1.8		8 53.8		-20 7.0		355 35.4		-17 2.9	
40	71 35.6		-19 6.5		57 11.5		-21 32.6		42 27.3		-22 32.2		27 48.9		-22 0.8		13 42.3		-20 4.9		0 24.7		-16 59.9	
14 0	76 23.8	288.2	-19 9.1	-2.5	61 59.3	287.8	-21 34.1	-1.4	47 15.0	287.7	-22 32.4	-0.2	32 36.9	288.0	-21 59.7	1.1	18 30.9	288.6	-20 2.8	2.2	5 14.0	289.3	-16 57.0	3.0
20	81 12.0		-19 11.7		66 47.1		-21 35.5		52 2.7		-22 32.6		37 24.9		-21 58.6		23 19.5		-20 0.6		10 3.3		-16 54.0	
40	86 0.2		-19 14.2		71 34.9		-21 36.9		56 50.4		-22 32.7		42 12.9		-21 57.5		28 8.1		-19 58.4		14 52.6		-16 51.0	
15 0	90 48.5	288.2	-19 16.7	-2.5	76 22.7	287.8	-21 38.3	-1.4	61 38.1	287.7	-22 32.9	-0.1	47 0.9	288.0	-21 56.4	1.1	32 56.6	288.6	-19 56.3	2.2	19 42.0	289.4	-16 48.0	3.0
20	95 36.7		-19 19.2		81 10.5		-21 39.7		66 25.8		-22 33.0		51 48.9		-21 55.3		37 45.2		-19 54.1		24 31.3		-16 45.0	
40	100 24.9		-19 21.7		85 58.3		-21 41.0		71 13.5		-22 33.1		56 36.9		-21 54.2		42 33.8		-19 51.9		29 20.7		-16 42.0	
16 0	105 13.0	288.2	-19 24.2	-2.5	90 46.1	287.8	-21 42.4	-1.3	76 1.2	287.7	-22 33.1	-0.1	61 24.9	288.0	-21 53.0	1.2	47 22.5	288.6	-19 49.6	2.2	34 10.0	289.4	-16 39.0	3.0
20	110 1.2		-19 26.7		95 33.9		-21 43.7		80 48.9		-22 33.2		66 12.9		-21 51.8		52 11.1		-19 47.4		38 59.4		-16 36.0	
40	114 49.4		-19 29.1		100 21.6		-21 45.0		85 36.6		-22 33.2		71 0.9		-21 50.6		56 59.7		-19 45.2		43 48.8		-16 32.9	
17 0	119 37.6	288.1	-19 31.6	-2.4	105 9.4	287.8	-21 46.3	-1.3	90 24.3	287.7	-22 33.3	0.0	75 49.0	288.0	-21 49.4	1.2	61 48.4	288.7	-19 42.9	2.3	48 38.2	289.4	-16 29.9	3.1
20	124 25.7		-19 34.0		109 57.2		-21 47.6		95 12.0		-22 33.3		80 37.0		-21 48.2		66 37.0		-19 40.6		53 27.6		-16 26.8	
40	129 13.9		-19 36.4		114 44.9		-21 48.8		99 59.8		-22 33.3		85 25.0		-21 47.0		71 25.7		-19 38.4		58 17.0		-16 23.7	
18 0	134 2.0	288.1	-19 38.8	-2.4	119 32.7	287.8	-21 50.1	-1.2	104 47.5	287.7	-22 33.2	0.1	90 13.1	288.1	-21 45.7	1.3	76 14.4	288.7	-19 36.1	2.3	63 6.5	289.5	-16 20.7	3.1
20	138 50.1		-19 41.2		124 20.5		-21 51.3		109 35.2		-22 33.2		95 1.1		-21 44.5		81 3.1		-19 33.8		67 55.9		-16 17.6	
40	143 38.3		-19 43.5		129 8.2		-21 52.5		114 22.9		-22 33.1		99 49.2		-21 43.2		85 51.8		-19 31.4		72 45.4		-16 14.5	
19 0	148 26.4	288.1	-19 45.9	-2.3	133 56.0	287.7	-21 53.7	-1.1	119 10.6	287.7	-22 33.0	0.1	104 37.3	288.1	-21 41.9	1.3	90 40.5	288.7	-19 29.1	2.4	77 34.8	289.5	-16 11.4	3.1
20	153 14.5		-19 48.2		138 43.7		-21 54.9		123 58.3		-22 32.9		109 25.4		-21 40.6		95 29.2		-19 26.8		82 24.3		-16 8.3	
40	158 2.6		-19 50.5		143 31.5		-21 56.0		128 46.1		-22 32.8		114 13.4		-21 39.2		100 17.9		-19 24.4		87 13.8		-16 5.2	
20 0	162 50.7	288.1	-19 52.8	-2.3	148 19.2	287.7	-21 57.1	-1.1	133 33.8	287.7	-22 32.7	0.2	119 1.5	288.1	-21 37.9	1.4	105 6.7	288.8	-19 22.0	2.4	92 3.3	289.5	-16 2.0	3.1
20	167 38.8		-19 55.1		153 6.9		-21 58.3		138 21.5		-22 32.5		123 49.6		-21 36.5		109 55.4		-19 19.7		96 52.8		-15 58.9	
40	172 26.9		-19 57.4		157 54.7		-21 59.4		143 9.3		-22 32.4		128 37.8		-21 35.1		114 44.2		-19 17.3		101 42.3		-15 55.7	
21 0	177 15.0	288.1	-19 59.7	-2.2	162 42.4	287.7	-22 0.5	-1.0	147 57.0	287.7	-22 32.2	0.2	133 25.9	288.1	-21 33.7	1.4	119 32.9	288.8	-19 14.9	2.4	106 31.8	289.5	-15 52.6	3.2
20	182 3.1		-20 1.9		167 30.1		-22 1.5		152 44.7		-22 32.0		138 14.0		-21 32.3		124 21.7		-19 12.4		111 21.4		-15 49.4	
40	186 51.1		-20 4.1		172 17.9		-22 2.6		157 32.5		-22 31.7		143 2.1		-21 30.9		129 10.5		-19 10.0		116 10.9		-15 46.2	
22 0	191 39.2	288.0	-20 6.3	-2.2	177 5.6	287.7	-22 3.6	-1.0	162 20.2	287.8	-22 31.5	0.3	147 50.3	288.2	-21 29.5	1.5	133 59.3	288.8	-19 7.6	2.5	121 0.5	289.6	-15 43.1	3.2
20	196 27.3		-20 8.5		181 53.3		-22 4.6		167 8.0		-22 31.2		152 38.4		-21 28.0		138 48.1		-19 5.1		125 50.0		-15 39.9	
40	201 15.3		-20 10.7		186 41.0		-22 5.6		171 55.7		-22 31.0		157 26.6		-21 26.5		143 36.9		-19 2.6		130 39.6		-15 36.7	
23 0	206 3.3	288.0	-20 12.9	-2.1	191 28.8	287.7	-22 6.6	-0.9	176 43.5	287.8	-22 30.7	0.3	162 14.7	288.2	-21 25.0	1.5	148 25.8	288.9	-19 0.2	2.5	135 29.2	289.6	-15 33.5	3.2
20	210 51.4		-20 15.1		196 16.5		-22 7.5		181 31.2		-22 30.4		167 2.9		-21 23.5		153 14.6		-18 57.7		140 18.8		-15 30.3	
40	215 39.4		-20 17.2		201 4.2		-22 8.5		186 19.0		-22 30.0		171 51.1		-21 22.0		158 3.5		-18 55.2		145 8.4		-15 27.0	

2011 Moon

	27 Dec						28 Dec						29 Dec						30 Dec						31 Dec						1 Jan					
	GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec			GHA			Dec		
h m	°	'	d	°	'	d '	°	'	d	°	'	d '	°	'	d	°	'	d '	°	'	d	°	'	d '	°	'	d	°	'	d '	°	'	d	°	'	d '
0 0	149	58.0	289.6	-15	23.8		137	57.0	290.3	-11	13.4		126	41.8	290.9	-6	39.2		116	0.5	291.3	-1	55.8		105	40.1	291.5	2	45.5		95	27.2	291.5	7	15.2	
20	154	47.7		-15	20.6	3.2	142	47.3		-11	9.8	3.7	131	32.7		-6	35.3	3.9	120	51.8		-1	51.8	4.0	110	31.6		2	49.3	3.8	100	18.7		7	18.8	3.6
40	159	37.3		-15	17.3		147	37.7		-11	6.1		136	23.6		-6	31.4		125	43.1		-1	47.9		115	23.0		2	53.2		105	10.2		7	22.5	
1 0	164	26.9	289.7	-15	14.1		152	28.0	290.4	-11	2.4		141	14.5	290.9	-6	27.5		130	34.4	291.3	-1	43.9		120	14.5	291.5	2	57.0		110	1.7	291.5	7	26.1	
20	169	16.6		-15	10.8	3.3	157	18.4		-10	58.7	3.7	146	5.4		-6	23.6	3.9	135	25.7		-1	40.0	3.9	125	6.0		3	0.9	3.8	114	53.1		7	29.7	3.6
40	174	6.3		-15	7.6		162	8.8		-10	55.0		150	56.3		-6	19.7		140	16.9		-1	36.0		129	57.4		3	4.7		119	44.6		7	33.3	
2 0	178	56.0	289.7	-15	4.3		166	59.1	290.4	-10	51.3		155	47.2	290.9	-6	15.8		145	8.2	291.3	-1	32.1		134	48.9	291.5	3	8.5		124	36.1	291.5	7	36.9	
20	183	45.7		-15	1.0	3.3	171	49.5		-10	47.6	3.7	160	38.1		-6	11.9	3.9	149	59.5		-1	28.2	3.9	139	40.4		3	12.4	3.8	129	27.6		7	40.5	3.6
40	188	35.4		-14	57.7		176	39.9		-10	43.9		165	29.1		-6	8.0		154	50.8		-1	24.2		144	31.9		3	16.2		134	19.0		7	44.1	
3 0	193	25.1	289.7	-14	54.4		181	30.3	290.4	-10	40.1		170	20.0	291.0	-6	4.0		159	42.1	291.3	-1	20.3		149	23.3	291.5	3	20.0		139	10.5	291.5	7	47.7	
20	198	14.8		-14	51.1	3.3	186	20.7		-10	36.4	3.7	175	11.0		-6	0.1	3.9	164	33.4		-1	16.3	3.9	154	14.8		3	23.8	3.8	144	2.0		7	51.3	3.6
40	203	4.5		-14	47.8		191	11.1		-10	32.7		180	1.9		-5	56.2		169	24.7		-1	12.4		159	6.3		3	27.7		148	53.5		7	54.9	
4 0	207	54.3	289.8	-14	44.5		196	1.6	290.4	-10	29.0		184	52.9	291.0	-5	52.3		174	16.1	291.3	-1	8.5		163	57.8	291.5	3	31.5		153	44.9	291.5	7	58.5	
20	212	44.0		-14	41.1	3.3	200	52.0		-10	25.2	3.8	189	43.9		-5	48.4	3.9	179	7.4		-1	4.5	4.0	168	49.3		3	35.3	3.8	158	36.4		8	2.1	3.6
40	217	33.8		-14	37.8		205	42.5		-10	21.5		194	34.8		-5	44.4		183	58.7		-1	0.6		173	40.7		3	39.1		163	27.9		8	5.6	
5 0	222	23.6	289.8	-14	34.5		210	32.9	290.5	-10	17.7		199	25.8	291.0	-5	40.5		188	50.0	291.3	-0	56.6		178	32.2	291.5	3	42.9		168	19.3	291.5	8	9.2	
20	227	13.4		-14	31.1	3.4	215	23.4		-10	14.0	3.7	204	16.8		-5	36.6	3.9	193	41.3		-0	52.7	3.9	183	23.7		3	46.7	3.8	173	10.8		8	12.8	3.6
40	232	3.2		-14	27.7		220	13.8		-10	10.2		209	7.8		-5	32.7		198	32.7		-0	48.8		188	15.2		3	50.5		178	2.2		8	16.3	
6 0	236	53.0	289.8	-14	24.4		225	4.3	290.5	-10	6.5		213	58.8	291.0	-5	28.7		203	24.0	291.3	-0	44.8		193	6.7	291.5	3	54.3		182	53.7	291.5	8	19.9	
20	241	42.8		-14	21.0	3.4	229	54.8		-10	2.7	3.8	218	49.8		-5	24.8	3.9	208	15.3		-0	40.9	3.9	197	58.2		3	58.1	3.8	187	45.2		8	23.4	3.5
40	246	32.6		-14	17.6		234	45.3		-9	59.0		223	40.8		-5	20.9		213	6.7		-0	37.0		202	49.6		4	1.9		192	36.6		8	27.0	
7 0	251	22.4	289.9	-14	14.2		239	35.8	290.5	-9	55.2		228	31.8	291.0	-5	16.9		217	58.0	291.3	-0	33.0		207	41.1	291.5	4	5.7		197	28.1	291.5	8	30.5	
20	256	12.3		-14	10.8	3.4	244	26.3		-9	51.4	3.8	233	22.8		-5	13.0	3.9	222	49.4		-0	29.1	3.9	212	32.6		4	9.5	3.8	202	19.5		8	34.1	3.6
40	261	2.1		-14	7.4		249	16.8		-9	47.7		238	13.9		-5	9.1		227	40.7		-0	25.2		217	24.1		4	13.3		207	11.0		8	37.6	
8 0	265	52.0	289.9	-14	4.0		254	7.4	290.5	-9	43.9		243	4.9	291.0	-5	5.1		232	32.1	291.4	-0	21.3		222	15.6	291.5	4	17.1		212	2.4	291.4	8	41.2	
20	270	41.9		-14	0.6	3.4	258	57.9		-9	40.1	3.8	247	55.9		-5	1.2	3.9	237	23.4		-0	17.3	3.9	227	7.1		4	20.9	3.8	216	53.9		8	44.7	3.5
40	275	31.8		-13	57.2		263	48.4		-9	36.3		252	47.0		-4	57.3		242	14.8		-0	13.4		231	58.6		4	24.7		221	45.3		8	48.2	
9 0	280	21.7	289.9	-13	53.8		268	39.0	290.6	-9	32.5		257	38.0	291.1	-4	53.3		247	6.2	291.4	-0	9.5		236	50.1	291.5	4	28.4		226	36.8	291.4	8	51.7	
20	285	11.6		-13	50.3	3.4	273	29.6		-9	28.8	3.8	262	29.1		-4	49.4	3.9	251	57.5		-0	5.6	3.9	241	41.6		4	32.2	3.8	231	28.2		8	55.2	3.5
40	290	1.5		-13	46.9		278	20.1		-9	25.0		267	20.1		-4	45.5		256	48.9		-0	1.6		246	33.1		4	36.0		236	19.7		8	58.8	
10 0	294	51.4	289.9	-13	43.5		283	10.7	290.6	-9	21.2		272	11.2	291.1	-4	41.5		261	40.3	291.4	0	2.3		251	24.5	291.5	4	39.8		241	11.1	291.4	9	2.3	
20	299	41.4		-13	40.0	3.5	288	1.3		-9	17.4	3.8	277	2.3		-4	37.6	3.9	266	31.6		0	6.2	3.9	256	16.0		4	43.5	3.7	246	2.5		9	5.8	3.5
40	304	31.3		-13	36.5		292	51.9		-9	13.6		281	53.4		-4	33.6		271	23.0		0	10.1		261	7.5		4	47.3		250	54.0		9	9.3	
11 0	309	21.3	290.0	-13	33.1		297	42.5	290.6	-9	9.8		286	44.4	291.1	-4	29.7		276	14.4	291.4	0	14.0		265	59.0	291.5	4	51.0		255	45.4	291.4	9	12.8	
20	314	11.2		-13	29.6	3.5	302	33.1		-9	6.0	3.8	291	35.5		-4	25.8	3.9	281	5.8		0	17.9	3.9	270	50.5		4	54.8	3.8	260	36.9		9	16.3	3.5
40	319	1.2		-13	26.1		307	23.7		-9	2.1		296	26.6		-4	21.8		285	57.2		0	21.9		275	42.0		4	58.6		265	28.3		9	19.7	
12 0	323	51.2	290.0	-13	22.6		312	14.3	290.6	-8	58.3		301	17.7	291.1	-4	17.9		290	48.6	291.4	0	25.8		280	33.5	291.5	5	2.3		270	19.7	291.4	9	23.2	
20	328	41.2		-13	19.2	3.5	317	5.0		-8	54.5	3.8	306	8.8		-4	13.9	4.0	295	40.0		0	29.7	3.9	285	25.0		5	6.1	3.8	275	11.1		9	26.7	3.5
40	333	31.2		-13	15.7		321	55.6		-8	50.7		310	59.9		-4	10.0		300	31.3		0	33.6		290	16.5		5	9.8		280	2.6		9	30.2	
13 0	338	21.2	290.0	-13	12.2		326	46.3	290.7	-8	46.9		315	51.0	291.1	-4	6.0		305	22.7	291.4	0	37.5		295	8.0	291.5	5	13.6		284	54.0	291.4	9	33.6	
20	343	11.2		-13	8.6	3.5	331	36.9		-8	43.0	3.8	320	42.2		-4	2.1	3.9	310	14.1		0	41.4	3.9	299	59.5		5	17.3	3.7	289	45.4		9	37.1	3.5
40	348	1.3		-13	5.1		336	27.6		-8	39.2		325	33.3		-3	58.1		315	5.5		0	45.3		304	51.0		5	21.0		294	36.8		9	40.5	
14 0	352	51.3	290.1	-13	1.6		341	18.2	290.7	-8	35.4		330	24.4	291.1	-3	54.2		319	57.0	291.4	0	49.2		309	42.5	291.5	5	24.8		299	28.2	291.4	9	44.0	
20	357	41.4		-12	58.1	3.5	346	8.9		-8	31.5	3.8	335	15.6		-3	50.2	3.9	324	48.4		0	53.1	3.9	314	34.0		5	28.5	3.7	304	19.7		9	47.5	3.4
40	2	31.4		-12	54.5		350	59.6		-8	27.7		340	6.7		-3	46.3		329	39.8		0	57.0		319	25.5		5	32.2		309	11.1		9	50.9	
15 0	7	21.5	290.1	-12	51.0		355	50.3	290.7	-8	23.9		344	57.8	291.2	-3	42.4		334	31.2	291.4	1	0.9		324	17.0	291.5	5	35.9		314	2.5	291.4	9	54.3	
20	12	11.6		-12	47.5	3.5	0	41.0		-8	20.0	3.9	349	49.0		-3	38.4	4.0	339	22.6		1	4.8	3.9	329	8.5		5	39.7	3.7	318	53.9		9	57.8	3.4
40	17	1.7		-12	43.9		5	31.7		-8	16.2		354	40.2		-3	34.5		344	14.0		1	8.7		333	60.0		5	43.4		323	45.3		10	1.2	
16 0	21	51.8	290.1	-12	40.4		10	22.4	290.7	-8	12.3		359	31.3	291.2	-3	30.5		349	5.4	291.4	1	12.6		338	51.5	291.5	5	47.1		328	36.7	291.4	10	4.6	
20	26	41.9		-12	36.8	3.6	15	13.2		-8	8.5	3.9	4	22.5		-3	26.6	3.9	353	56.9		1	16.5	3.9	343	43.0		5	50.8	3.7	333	28.1		10	8.0	3.4
40	31	32.0		-12	33.2		20	3.9		-8	4.6		9	13.6		-3	22.6		358	48.3		1	20.4		348	34.4		5	54.5		338	19.5		10	11.5	
17 0	36	22.1	290.2	-12	29.7		24	54.6	290.8	-8	0.7		14	4.8	291.2	-3	18.7		3	39.7	291.4	1	24.3		353	25.9	291.5	5	58.2		343	10.9	291.4	10	14.9	
20	41	12.3		-12	26.1	3.6	29	45.4		-7	56.9	3.8	18	56.0		-3	14.7	4.0	8	31.1		1	28.2	3.9	358	17.4		6	1.9	3.7	348	2.3		10	18.3	3.4
40	46	2.4		-12	22.5		34	36.1		-7	53.0		23	47.2		-3	10.8		13	22.6		1	32.0		3	8.9		6	5.6		352	53.7		10	21.7	
18 0	50	52.6	290.2	-12	18.9		39	26.9	290.8	-7	49.2		28	38.4	291.2	-3	6.8		18	14.0	291.4	1	35.9		8	0.4	291.5	6	9.3		357	45.1	291.4	10	25.1	
20	55	42.7		-12	15.3	3.6	44	17.7		-7	45.3	3.9	33	29.6		-3	2.9	3.9	23	5.4		1	39.8	3.9	12	51.9		6	13.0	3.7	2	36.4		10	28.5	3.4
40	60	32.9		-12	11.7		49	8.4		-7	41.4		38	20.8		-2	58.9		27	56.9		1	43.7		17	43.4		6	16.7		7	27.8		10	31.8	
19 0	65	23.1	290.2	-12	8.1		53	59.2	290.8	-7	37.6		43	12.0	291.2	-2	55.0		32	48.3	291.4	1	47.6		22	34.9	291.5	6	20.4		12	19.2	291.4	10	35.2	
20	70	13.3		-12	4.5	3.6	58	50.0		-7	33.7	3.9	48	3.2		-2	51.0	4.0	37	39.7		1	51.4	3.9	27	26.4		6	24.1	3.7	17	10.6		10	38.6	3.4
40	75	3.5		-12	0.9		63	40.8		-7	29.8		52	54.4		-2	47.1		42	31.2		1	55.3		32	17.9		6	27.7		22	2.0		10	42.0	
20 0	79	53.7	290.2	-11	57.3		68	31.6	290.8	-7	25.9		57	45.6	291.2	-2	43.1		47	22.6	291.4	1	59.2		37	9.4	291.5	6	31.4		26	53.3	291.4	10	45.3	
20	84	43.9		-11	53.6	3.6	73	22.4		-7	22.0	3.9	62	36.8		-2	39.2	3.9	52	14.1		2	3.1	3.9	42	0.9		6	35.1	3.7	31	44.7		10	48.7	3.4
40	89	34.2		-11	50.0		78	13.2		-7	18.2		67	28.1		-2	35.2		57	5.5		2	6.9		46	52.4		6	38.8		36	36.1		10	52.1	
21 0	94	24.4	290.3	-11	46.4		83	4.0	290.8	-7	14.3		72	19.3	291.2	-2	31.3		61	57.0	291.5	2	10.8		51	43.8	291.5	6	42.4		41	27.4	291.4	10	55.4	
20	99	14.7		-11	42.7	3.7	87	54.9		-7	10.4	3.9	77	10.5		-2	27.3	4.0	66	48.4		2	14.7	3.9	56	35.3		6	46.1	3.7	46	18.8		10	58.8	3.3
40	104	4.9		-11	39.1		92	45.7		-7	6.5		82	1.8		-2	23.4		71	39.9		2	18.5		61	26.8		6	49.7		51	10.2		11	2.1	
22 0	108	55.2	290.3	-11	35.4		97	36.6	290.9	-7	2.6		86	53.0	291.3	-2	19.4		76	31.3	291.5	2	22.4		66	18.3	291.5	6	53.4		56	1.5	291.3	11	5.4	
20	113	45.5		-11	31.8	3.6	102	27.4		-6	58.7	3.9	91	44.2		-2	15.5	3.9	81	22.8		2	26.2	3.8	71	9.8		6	57.0	3.6	60	52.9		11	8.8	3.3
40	118	35.8		-11	28.1		107	18.3		-6	54.8		96	35.5		-2	11.5		86	14.2		2	30.1		76	1.3		7	0.7		65	44.2		11	12.1	
23 0	123	26.1	290.3	-11	24.5		112	9.1	290.9	-6	50.9		101	26.8	291.3	-2	7.6		91	5.7	291.5	2	33.9		80	52.8	291.5	7	4.3		70	35.6	291.3	11	15.4	
20	128	16.4		-11	20.8	3.7	117	0.0		-6	47.0	3.9	106	18.0		-2	3.6	3.9	95	57.2		2	37.8	3.9	85	44.3		7	8.0	3.6	75	26.9		11	18.7	3.3
40	133	6.7		-11	17.1		121	50.9		-6	43.1		111	9.3		-1	59.7		100	48.6		2	41.6		90	35.7		7	11.6		80	18.2		11	22.0	