

I slightly modified Thorstensen's code to print out the time between evening twilight and morning twilight. For Okie-Tex site (site code = o) near Kenton OK I used same time zone as for Oklahoma City.

W. Romanishin- August 2013 - email: wromanishin at ou.edu - Here is stuff from John T. intro:

***** 2014 Night-time Astronomical Calendar for Cerro Tololo *****

By John Thorstensen, Dartmouth College

This calendar is designed to provide information useful for the planning of nighttime observations. The format should minimize confusion; each line gives the phenomena for a single (local!) night, and each line is labeled with both evening and morning (local) day and date. Note that all times given are LOCAL CIVIL (zone) times. DAYLIGHT SAVINGS time is used, with a non-USA convention.

The rise/set times printed are the times at which the center of the object is 50 arcminutes below the geometrical horizon. At the given twilight, the center of the sun is -0.0 degrees below the geometrical horizon.

The moon positions (and rise/set times) are generated by an implementation of the Low-Precision formulae in the Astronomical Almanac. The Almanac states that the error seldom exceeds 0.3 degrees. Topocentric corrections are included. Comparisons with tables for Kitt Peak in the NOAO Newsletter indicate that the rise-set times are good to +- 2 min or so. The moon's RA, Dec, and illuminated fraction are given for local midnight, regardless of whether the moon is actually up at that time. Note that the moonrise and moonset times are not printed if they occur near mid-day.

The LST at evening and morning twilight are tabulated. This gives an accurate idea of the range of RA's accessible during the night.

The JD is given (severely rounded off) for local midnight. Again, this avoids any ambiguity.

Some credits: The sidereal time and Julian date routines were originally coded in PL/I by Steve Maker of Dartmouth College. The algorithms originated in the old American Ephemeris. The routine to convert JD back to calendar date is adapted from Numerical Recipes in C, by Press et al.

CAUTIONS: I believe that the program which generates these tables is reasonably accurate. However, it has not been exhaustively tested, so you should be sure to run 'sanity checks' on the results. Also, in view of the approximations used, the results should not be used when high precision is needed. Extension to dates far from the present (1990) should be done with great caution. The code has not been tested for the eastern or southern hemispheres. Rise/set times are slightly inaccurate and rather confusing at circumpolar latitudes, where the concept of a 'night' is blurry.

The daylight savings time conventions (if used) are quite specific (to U. S., post-1986) and subject to change. I know that the code has many infelicities; if you should find actual errors, please notify
John.Thorstensen@dartmouth.edu

[This output comes from a (hopefully) portable, completely self-contained program in the c language. It is available from the author and may be used freely for scientific or educational purposes. If you use it for profit, please contact the author to arrange a (modest!) fee. Source code is copyright John Thorstensen, 1990.]

MOON PHASES FOR 2014, at Cerro Tololo

Times and dates are given in local time, zone = 4 hr West.
 They are generally better than +/- 2 minutes.
 Daylight savings time used.

The end of the previous year and the beginning of the next
 are included for continuity.

NEW		1ST		FULL		LAST	
Dec 02	21 22	Dec 09	12 13	Dec 17	6 29	Dec 25	10 50
Jan 01	8 15	Jan 08	0 40	Jan 16	1 54	Jan 24	2 21
Jan 30	18 41	Feb 06	16 23	Feb 14	20 55	Feb 22	14 17
Mar 01	5 03	Mar 08	10 27	Mar 16	13 11	Mar 23	21 48
Mar 30	14 48	Apr 07	4 32	Apr 15	3 45	Apr 22	3 53
Apr 29	2 18	May 06	23 17	May 14	15 19	May 21	9 01
May 28	14 43	Jun 05	16 41	Jun 13	0 14	Jun 19	14 40
Jun 27	4 11	Jul 05	8 01	Jul 12	7 27	Jul 18	22 10
Jul 26	18 43	Aug 03	20 51	Aug 10	14 11	Aug 17	8 27
Aug 25	10 13	Sep 02	7 12	Sep 08	21 39	Sep 15	22 06
Sep 24	2 14	Oct 01	15 33	Oct 08	6 51	Oct 15	16 13
Oct 23	18 56	Oct 30	23 49	Nov 06	19 23	Nov 14	12 18
Nov 22	9 32	Nov 29	7 07	Dec 06	9 27	Dec 14	9 54
Dec 21	22 36	Dec 28	15 33	Jan 05	1 54	Jan 13	6 49

Calendar for Cerro Tololo, west longitude (h.m.s) = 4 43 16, latitude (d.m) = -30 09.9
 Rise/set times in Chilean time (4 hr W), for 2215 m above surroundings, DAYLIGHT time used, * shows clock reset.
 Moon info is for local midnight, even if moon is down. Program: John Thorstensen, Dartmouth College.

***** 2014 JANUARY *****

Date (eve/morn)	LMST midn	----- Sun: -----				LST twilight:		----- Moon: -----				Twi-Twi hours	
		set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec	
Wed Jan 01/Thu Jan 02	5 03	20 56	22 24	5 10	6 38	3 28	10 14	.....	21 05	1	19 25.6	-16 16	6.8
Thu Jan 02/Fri Jan 03	5 07	20 56	22 25	5 11	6 39	3 32	10 19	.....	21 57	4	20 26.9	-13 11	6.8
Fri Jan 03/Sat Jan 04	5 11	20 57	22 25	5 12	6 40	3 36	10 24	.....	22 44	10	21 25.6	- 9 13	6.8
Sat Jan 04/Sun Jan 05	5 15	20 57	22 25	5 13	6 40	3 40	10 29	.....	23 27	19	22 21.7	- 4 45	6.8
Sun Jan 05/Mon Jan 06	5 19	20 57	22 24	5 14	6 41	3 43	10 34	.....	0 08	28	23 15.5	- 0 05	6.8
Mon Jan 06/Tue Jan 07	5 23	20 57	22 24	5 15	6 42	3 47	10 39	.....	0 46	39	0 07.7	4 30	6.8
Tue Jan 07/Wed Jan 08	5 27	20 57	22 24	5 16	6 43	3 51	10 44	.....	1 24	49	0 58.8	8 45	6.9
Wed Jan 08/Thu Jan 09	5 31	20 57	22 24	5 17	6 44	3 55	10 48	.....	2 03	60	1 49.6	12 31	6.9
Thu Jan 09/Fri Jan 10	5 35	20 57	22 24	5 18	6 45	3 59	10 53	.....	2 43	69	2 40.4	15 38	6.9
Fri Jan 10/Sat Jan 11	5 39	20 57	22 24	5 19	6 45	4 02	10 58	.....	3 25	78	3 31.5	18 00	6.9
Sat Jan 11/Sun Jan 12	5 43	20 57	22 23	5 20	6 46	4 06	11 03	.....	4 10	86	4 22.9	19 32	6.9
Sun Jan 12/Mon Jan 13	5 47	20 57	22 23	5 21	6 47	4 10	11 08	17 56	4 57	92	5 14.4	20 10	7.0
Mon Jan 13/Tue Jan 14	5 51	20 57	22 23	5 22	6 48	4 13	11 14	18 44	5 47	96	6 05.6	19 55	7.0
Tue Jan 14/Wed Jan 15	5 55	20 57	22 22	5 23	6 49	4 17	11 19	19 29	.....	99	6 56.2	18 49	7.0
Wed Jan 15/Thu Jan 16	5 59	20 56	22 22	5 24	6 50	4 20	11 24	20 11	.....	100	7 45.7	16 54	7.0
Thu Jan 16/Fri Jan 17	6 03	20 56	22 22	5 25	6 51	4 24	11 29	20 50	.....	99	8 34.1	14 18	7.1
Fri Jan 17/Sat Jan 18	6 07	20 56	22 21	5 26	6 51	4 27	11 34	21 27	.....	96	9 21.4	11 08	7.1
Sat Jan 18/Sun Jan 19	6 10	20 56	22 21	5 27	6 52	4 31	11 39	22 02	.....	92	10 07.8	7 32	7.1
Sun Jan 19/Mon Jan 20	6 14	20 55	22 20	5 29	6 53	4 34	11 44	22 35	.....	86	10 53.8	3 39	7.1
Mon Jan 20/Tue Jan 21	6 18	20 55	22 19	5 30	6 54	4 37	11 49	23 09	.....	79	11 40.0	- 0 24	7.2
Tue Jan 21/Wed Jan 22	6 22	20 55	22 19	5 31	6 55	4 41	11 54	23 43	.....	70	12 26.9	- 4 27	7.2
Wed Jan 22/Thu Jan 23	6 26	20 54	22 18	5 32	6 56	4 44	11 59	0 19	.....	61	13 15.2	- 8 21	7.2
Thu Jan 23/Fri Jan 24	6 30	20 54	22 18	5 33	6 57	4 47	12 04	0 58	.....	51	14 05.7	-11 56	7.3
Fri Jan 24/Sat Jan 25	6 34	20 53	22 17	5 34	6 58	4 51	12 10	1 41	.....	40	14 58.9	-14 58	7.3
Sat Jan 25/Sun Jan 26	6 38	20 53	22 16	5 36	6 59	4 54	12 15	2 30	.....	30	15 55.1	-17 13	7.3
Sun Jan 26/Mon Jan 27	6 42	20 53	22 15	5 37	7 00	4 57	12 20	3 25	.....	20	16 54.2	-18 28	7.4
Mon Jan 27/Tue Jan 28	6 46	20 52	22 15	5 38	7 01	5 00	12 25	4 26	17 47	11	17 55.4	-18 31	7.4
Tue Jan 28/Wed Jan 29	6 50	20 51	22 14	5 39	7 01	5 03	12 30	5 33	18 46	5	18 57.5	-17 16	7.4
Wed Jan 29/Thu Jan 30	6 54	20 51	22 13	5 40	7 02	5 07	12 35	.....	19 41	1	19 59.3	-14 45	7.5
Thu Jan 30/Fri Jan 31	6 58	20 50	22 12	5 41	7 03	5 10	12 40	.....	20 31	0	20 59.6	-11 12	7.5
Fri Jan 31/Sat Feb 01	7 02	20 50	22 11	5 43	7 04	5 13	12 45	.....	21 17	2	21 57.8	- 6 53	7.5

***** 2014 FEBRUARY *****

Date (eve/morn)	LMST midn	----- Sun: -----				LST twilight:		----- Moon: -----				Twi-Twi hours	
		set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec	
Sat Feb 01/Sun Feb 02	7 06	20 49	22 10	5 44	7 05	5 16	12 50	.....	22 00	7	22 54.0	- 2 12	7.6
Sun Feb 02/Mon Feb 03	7 10	20 48	22 09	5 45	7 06	5 19	12 56	.....	22 41	14	23 48.3	2 32	7.6
Mon Feb 03/Tue Feb 04	7 14	20 48	22 08	5 46	7 07	5 22	13 01	.....	23 21	23	0 41.3	7 02	7.6
Tue Feb 04/Wed Feb 05	7 17	20 47	22 08	5 47	7 08	5 25	13 06	.....	0 01	32	1 33.5	11 04	7.7
Wed Feb 05/Thu Feb 06	7 21	20 46	22 07	5 48	7 09	5 28	13 11	.....	0 42	43	2 25.2	14 27	7.7
Thu Feb 06/Fri Feb 07	7 25	20 46	22 06	5 50	7 09	5 31	13 16	.....	1 24	53	3 16.9	17 06	7.7
Fri Feb 07/Sat Feb 08	7 29	20 45	22 05	5 51	7 10	5 34	13 21	.....	2 08	62	4 08.5	18 54	7.8
Sat Feb 08/Sun Feb 09	7 33	20 44	22 03	5 52	7 11	5 36	13 26	.....	2 55	72	4 59.9	19 50	7.8
Sun Feb 09/Mon Feb 10	7 37	20 43	22 02	5 53	7 12	5 39	13 31	.....	3 43	80	5 51.1	19 52	7.8
Mon Feb 10/Tue Feb 11	7 41	20 42	22 01	5 54	7 13	5 42	13 36	17 27	4 33	87	6 41.7	19 02	7.9
Tue Feb 11/Wed Feb 12	7 45	20 42	22 00	5 55	7 14	5 45	13 41	18 10	5 25	93	7 31.4	17 24	7.9
Wed Feb 12/Thu Feb 13	7 49	20 41	21 59	5 56	7 15	5 48	13 46	18 50	6 16	97	8 20.2	15 02	7.9
Thu Feb 13/Fri Feb 14	7 53	20 40	21 58	5 57	7 15	5 51	13 51	19 28	.....	99	9 08.0	12 04	8.0
Fri Feb 14/Sat Feb 15	7 57	20 39	21 57	5 58	7 16	5 53	13 56	20 03	.....	100	9 55.2	8 35	8.0
Sat Feb 15/Sun Feb 16	8 01	20 38	21 56	5 59	7 17	5 56	14 01	20 38	.....	99	10 41.8	4 46	8.1
Sun Feb 16/Mon Feb 17	8 05	20 37	21 55	6 00	7 18	5 59	14 06	21 11	.....	96	11 28.5	0 44	8.1
Mon Feb 17/Tue Feb 18	8 09	20 36	21 53	6 01	7 19	6 02	14 11	21 46	.....	91	12 15.7	- 3 21	8.1
Tue Feb 18/Wed Feb 19	8 13	20 35	21 52	6 02	7 19	6 05	14 16	22 21	.....	84	13 03.9	- 7 18	8.2
Wed Feb 19/Thu Feb 20	8 17	20 34	21 51	6 03	7 20	6 07	14 21	22 59	.....	76	13 53.8	-10 57	8.2
Thu Feb 20/Fri Feb 21	8 21	20 33	21 50	6 04	7 21	6 10	14 26	23 40	.....	66	14 45.7	-14 05	8.2
Fri Feb 21/Sat Feb 22	8 25	20 32	21 49	6 05	7 22	6 13	14 31	0 25	.....	56	15 40.0	-16 31	8.3
Sat Feb 22/Sun Feb 23	8 28	20 31	21 47	6 06	7 23	6 15	14 36	1 16	.....	45	16 36.7	-18 03	8.3
Sun Feb 23/Mon Feb 24	8 32	20 30	21 46	6 07	7 23	6 18	14 41	2 12	.....	34	17 35.3	-18 30	8.4
Mon Feb 24/Tue Feb 25	8 36	20 29	21 45	6 08	7 24	6 21	14 46	3 14	.....	24	18 35.1	-17 46	8.4
Tue Feb 25/Wed Feb 26	8 40	20 28	21 44	6 09	7 25	6 24	14 50	4 19	17 26	14	19 35.2	-15 50	8.4
Wed Feb 26/Thu Feb 27	8 44	20 27	21 42	6 10	7 26	6 26	14 55	5 26	18 17	7	20 34.6	-12 48	8.5
Thu Feb 27/Fri Feb 28	8 48	20 26	21 41	6 11	7 26	6 29	15 00	6 34	19 05	2	21 32.8	- 8 54	8.5
Fri Feb 28/Sat Mar 01	8 52	20 25	21 40	6 12	7 27	6 32	15 05	.....	19 49	0	22 29.5	- 4 26	8.5

Calendar for Cerro Tololo, west longitude (h.m.s) = 4 43 16, latitude (d.m) = -30 09.9
 Rise/set times in Chilean time (4 hr W), for 2215 m above surroundings, DAYLIGHT time used, * shows clock reset.
 Moon info is for local midnight, even if moon is down. Program: John Thorstensen, Dartmouth College.

***** 2014 MARCH *****

Date (eve/morn)	LMST midn	----- Sun: -----			LST twilight:		----- Moon: -----				RA	Dec	Twi-Twi hours
		set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum			
Sat Mar 01/Sun Mar 02	8 56	20 24	21 39	6 13	7 28	6 34	15 10	.....	20 32	1	23 24.9	0 17	8.6
Sun Mar 02/Mon Mar 03	9 00	20 23	21 37	6 14	7 28	6 37	15 15	.....	21 13	4	0 19.1	4 56	8.6
Mon Mar 03/Tue Mar 04	9 04	20 21	21 36	6 14	7 29	6 40	15 19	.....	21 54	10	1 12.7	9 14	8.6
Tue Mar 04/Wed Mar 05	9 08	20 20	21 35	6 15	7 30	6 42	15 24	.....	22 36	17	2 05.7	12 57	8.7
Wed Mar 05/Thu Mar 06	9 12	20 19	21 33	6 16	7 31	6 45	15 29	.....	23 19	26	2 58.5	15 56	8.7
Thu Mar 06/Fri Mar 07	9 16	20 18	21 32	6 17	7 31	6 48	15 34	.....	0 03	35	3 51.1	18 04	8.7
Fri Mar 07/Sat Mar 08	9 20	20 17	21 31	6 18	7 32	6 50	15 39	.....	0 50	45	4 43.3	19 18	8.8
Sat Mar 08/Sun Mar 09*	9 24	20 16	21 30	5 19	6 33	6 53	15 43	.....	1 38	55	5 34.9	19 39	8.8
Sun Mar 09/Mon Mar 10	10 28	19 14	20 28	5 19	6 33	6 55	15 48	.....	1 28	65	6 27.3	19 01	8.9
Mon Mar 10/Tue Mar 11	10 32	19 13	20 27	5 20	6 34	6 58	15 53	.....	2 19	73	7 17.1	17 38	8.9
Tue Mar 11/Wed Mar 12	10 36	19 12	20 26	5 21	6 35	7 01	15 57	.....	3 10	81	8 05.9	15 30	8.9
Wed Mar 12/Thu Mar 13	10 40	19 11	20 24	5 22	6 35	7 03	16 02	.....	4 02	88	8 53.9	12 44	9.0
Thu Mar 13/Fri Mar 14	10 44	19 10	20 23	5 22	6 36	7 06	16 07	17 03	4 55	94	9 41.3	9 26	9.0
Fri Mar 14/Sat Mar 15	10 47	19 08	20 22	5 23	6 37	7 09	16 12	17 38	5 48	98	10 28.4	5 42	9.0
Sat Mar 15/Sun Mar 16	10 51	19 07	20 21	5 24	6 37	7 11	16 16	18 12	6 42	100	11 15.6	1 43	9.1
Sun Mar 16/Mon Mar 17	10 55	19 06	20 19	5 25	6 38	7 14	16 21	18 46	.....	100	12 03.4	- 2 24	9.1
Mon Mar 17/Tue Mar 18	10 59	19 05	20 18	5 25	6 38	7 17	16 26	19 22	.....	98	12 52.3	- 6 27	9.1
Tue Mar 18/Wed Mar 19	11 03	19 04	20 17	5 26	6 39	7 19	16 30	20 00	.....	94	13 42.8	-10 14	9.2
Wed Mar 19/Thu Mar 20	11 07	19 02	20 15	5 27	6 40	7 22	16 35	20 40	.....	88	14 35.3	-13 32	9.2
Thu Mar 20/Fri Mar 21	11 11	19 01	20 14	5 27	6 40	7 25	16 39	21 24	.....	80	15 29.8	-16 09	9.2
Fri Mar 21/Sat Mar 22	11 15	19 00	20 13	5 28	6 41	7 27	16 44	22 13	.....	70	16 26.3	-17 51	9.3
Sat Mar 22/Sun Mar 23	11 19	18 59	20 12	5 29	6 42	7 30	16 49	23 07	.....	59	17 24.3	-18 31	9.3
Sun Mar 23/Mon Mar 24	11 23	18 58	20 10	5 29	6 42	7 33	16 53	0 05	.....	48	18 23.0	-18 02	9.3
Mon Mar 24/Tue Mar 25	11 27	18 56	20 09	5 30	6 43	7 35	16 58	1 07	.....	37	19 21.7	-16 25	9.4
Tue Mar 25/Wed Mar 26	11 31	18 55	20 08	5 31	6 43	7 38	17 02	2 11	.....	26	20 19.7	-13 44	9.4
Wed Mar 26/Thu Mar 27	11 35	18 54	20 07	5 31	6 44	7 41	17 07	3 17	.....	17	21 16.6	-10 11	9.4
Thu Mar 27/Fri Mar 28	11 39	18 53	20 05	5 32	6 45	7 43	17 12	4 22	16 41	9	22 12.2	- 6 00	9.4
Fri Mar 28/Sat Mar 29	11 43	18 52	20 04	5 33	6 45	7 46	17 16	5 27	17 23	3	23 06.8	- 1 27	9.5
Sat Mar 29/Sun Mar 30	11 47	18 50	20 03	5 33	6 46	7 49	17 21	6 31	18 04	1	0 00.6	3 09	9.5
Sun Mar 30/Mon Mar 31	11 51	18 49	20 02	5 34	6 46	7 51	17 25	.....	18 45	0	0 54.0	7 32	9.5
Mon Mar 31/Tue Apr 01	11 55	18 48	20 00	5 34	6 47	7 54	17 30	.....	19 27	2	1 47.2	11 27	9.6

***** 2014 APRIL *****

Date (eve/morn)	LMST midn	----- Sun: -----			LST twilight:		----- Moon: -----				RA	Dec	Twi-Twi hours
		set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum			
Tue Apr 01/Wed Apr 02	11 58	18 47	19 59	5 35	6 48	7 57	17 34	.....	20 10	7	2 40.5	14 43	9.6
Wed Apr 02/Thu Apr 03	12 02	18 46	19 58	5 36	6 48	8 00	17 39	.....	20 55	13	3 33.7	17 09	9.6
Thu Apr 03/Fri Apr 04	12 06	18 44	19 57	5 36	6 49	8 02	17 44	.....	21 41	20	4 26.5	18 42	9.7
Fri Apr 04/Sat Apr 05	12 10	18 43	19 56	5 37	6 49	8 05	17 48	.....	22 30	29	5 18.8	19 20	9.7
Sat Apr 05/Sun Apr 06	12 14	18 42	19 54	5 37	6 50	8 08	17 53	.....	23 20	38	6 10.1	19 03	9.7
Sun Apr 06/Mon Apr 07	12 18	18 41	19 53	5 38	6 51	8 11	17 57	.....	0 11	47	7 00.3	17 57	9.7
Mon Apr 07/Tue Apr 08	12 22	18 40	19 52	5 39	6 51	8 14	18 02	.....	1 02	57	7 49.4	16 04	9.8
Tue Apr 08/Wed Apr 09	12 26	18 39	19 51	5 39	6 52	8 16	18 06	.....	1 54	66	8 37.4	13 32	9.8
Wed Apr 09/Thu Apr 10	12 30	18 37	19 50	5 40	6 52	8 19	18 11	.....	2 46	75	9 24.6	10 26	9.8
Thu Apr 10/Fri Apr 11	12 34	18 36	19 49	5 40	6 53	8 22	18 15	.....	3 39	83	10 11.5	6 53	9.9
Fri Apr 11/Sat Apr 12	12 38	18 35	19 48	5 41	6 54	8 25	18 20	.....	4 33	90	10 58.5	3 00	9.9
Sat Apr 12/Sun Apr 13	12 42	18 34	19 47	5 41	6 54	8 28	18 24	16 45	5 27	95	11 46.2	- 1 05	9.9
Sun Apr 13/Mon Apr 14	12 46	18 33	19 46	5 42	6 55	8 31	18 29	17 20	6 24	98	12 35.1	- 5 12	9.9
Mon Apr 14/Tue Apr 15	12 50	18 32	19 45	5 43	6 55	8 34	18 33	17 57	7 22	100	13 25.8	- 9 08	10.0
Tue Apr 15/Wed Apr 16	12 54	18 31	19 44	5 43	6 56	8 36	18 38	18 37	.....	99	14 18.7	-12 40	10.0
Wed Apr 16/Thu Apr 17	12 58	18 30	19 43	5 44	6 57	8 39	18 42	19 21	.....	96	15 14.0	-15 34	10.0
Thu Apr 17/Fri Apr 18	13 02	18 29	19 42	5 44	6 57	8 42	18 47	20 09	.....	90	16 11.4	-17 35	10.0
Fri Apr 18/Sat Apr 19	13 05	18 28	19 41	5 45	6 58	8 45	18 51	21 02	.....	83	17 10.2	-18 32	10.1
Sat Apr 19/Sun Apr 20	13 09	18 26	19 40	5 45	6 58	8 48	18 56	22 00	.....	73	18 09.7	-18 19	10.1
Sun Apr 20/Mon Apr 21	13 13	18 25	19 39	5 46	6 59	8 51	19 00	23 01	.....	62	19 08.9	-16 56	10.1
Mon Apr 21/Tue Apr 22	13 17	18 24	19 38	5 46	7 00	8 54	19 05	0 04	.....	51	20 06.8	-14 30	10.1
Tue Apr 22/Wed Apr 23	13 21	18 23	19 37	5 47	7 00	8 57	19 09	1 08	.....	40	21 03.2	-11 11	10.2
Wed Apr 23/Thu Apr 24	13 25	18 22	19 36	5 47	7 01	9 00	19 14	2 11	.....	29	21 58.1	- 7 13	10.2
Thu Apr 24/Fri Apr 25	13 29	18 21	19 35	5 48	7 02	9 03	19 18	3 14	.....	19	22 51.6	- 2 51	10.2
Fri Apr 25/Sat Apr 26	13 33	18 21	19 34	5 48	7 02	9 06	19 22	4 17	.....	11	23 44.3	1 39	10.2
Sat Apr 26/Sun Apr 27	13 37	18 20	19 33	5 49	7 03	9 09	19 27	5 18	16 40	5	0 36.6	6 02	10.3
Sun Apr 27/Mon Apr 28	13 41	18 19	19 32	5 50	7 03	9 13	19 31	6 20	17 20	1	1 29.0	10 03	10.3
Mon Apr 28/Tue Apr 29	13 45	18 18	19 32	5 50	7 04	9 16	19 36	7 20	18 02	0	2 21.6	13 32	10.3
Tue Apr 29/Wed Apr 30	13 49	18 17	19 31	5 51	7 05	9 19	19 40	.....	18 46	1	3 14.6	16 16	10.3
Wed Apr 30/Thu May 01	13 53	18 16	19 30	5 51	7 05	9 22	19 45	.....	19 32	4	4 07.6	18 08	10.4

Calendar for Cerro Tololo, west longitude (h.m.s) = 4 43 16, latitude (d.m) = -30 09.9
 Rise/set times in Chilean time (4 hr W), for 2215 m above surroundings, DAYLIGHT time used, * shows clock reset.
 Moon info is for local midnight, even if moon is down. Program: John Thorstensen, Dartmouth College.

***** 2014 MAY *****

Date (eve/morn)	LMST midn	----- Sun: -----				LST twilight:		----- Moon: -----				Twi-Twi hours	
		set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec	
Thu May 01/Fri May 02	13 57	18 15	19 29	5 52	7 06	9 25	19 49	.....	20 20	9	5 00.4	19 06	10.4
Fri May 02/Sat May 03	14 01	18 14	19 28	5 52	7 06	9 28	19 54	.....	21 10	15	5 52.4	19 09	10.4
Sat May 03/Sun May 04	14 05	18 13	19 28	5 53	7 07	9 32	19 58	.....	22 01	23	6 43.2	18 19	10.4
Sun May 04/Mon May 05	14 09	18 13	19 27	5 53	7 08	9 35	20 03	.....	22 53	31	7 32.8	16 42	10.4
Mon May 05/Tue May 06	14 12	18 12	19 26	5 54	7 08	9 38	20 07	.....	23 45	40	8 21.0	14 23	10.5
Tue May 06/Wed May 07	14 16	18 11	19 26	5 54	7 09	9 41	20 12	.....	0 37	50	9 08.1	11 30	10.5
Wed May 07/Thu May 08	14 20	18 10	19 25	5 55	7 10	9 45	20 16	.....	1 29	59	9 54.5	8 08	10.5
Thu May 08/Fri May 09	14 24	18 10	19 24	5 55	7 10	9 48	20 21	.....	2 22	68	10 40.8	4 24	10.5
Fri May 09/Sat May 10	14 28	18 09	19 24	5 56	7 11	9 51	20 25	.....	3 15	77	11 27.6	0 25	10.5
Sat May 10/Sun May 11	14 32	18 08	19 23	5 56	7 11	9 55	20 30	.....	4 11	85	12 15.5	- 3 40	10.6
Sun May 11/Mon May 12	14 36	18 08	19 23	5 57	7 12	9 58	20 34	.....	5 08	92	13 05.3	- 7 42	10.6
Mon May 12/Tue May 13	14 40	18 07	19 22	5 57	7 13	10 01	20 38	16 31	6 07	97	13 57.6	-11 26	10.6
Tue May 13/Wed May 14	14 44	18 06	19 22	5 58	7 13	10 05	20 43	17 14	7 08	99	14 52.6	-14 40	10.6
Wed May 14/Thu May 15	14 48	18 06	19 21	5 58	7 14	10 08	20 47	18 01	.....	100	15 50.5	-17 06	10.6
Thu May 15/Fri May 16	14 52	18 05	19 21	5 59	7 15	10 12	20 52	18 53	.....	97	16 50.6	-18 29	10.6
Fri May 16/Sat May 17	14 56	18 04	19 20	5 59	7 15	10 15	20 56	19 51	.....	92	17 51.9	-18 39	10.7
Sat May 17/Sun May 18	15 00	18 04	19 20	6 00	7 16	10 19	21 01	20 52	.....	85	18 53.1	-17 35	10.7
Sun May 18/Mon May 19	15 04	18 03	19 19	6 00	7 16	10 22	21 05	21 56	.....	76	19 53.0	-15 21	10.7
Mon May 19/Tue May 20	15 08	18 03	19 19	6 01	7 17	10 26	21 10	23 01	.....	65	20 50.9	-12 09	10.7
Tue May 20/Wed May 21	15 12	18 02	19 18	6 01	7 18	10 29	21 14	0 05	.....	53	21 46.6	- 8 16	10.7
Wed May 21/Thu May 22	15 16	18 02	19 18	6 02	7 18	10 33	21 18	1 08	.....	42	22 40.4	- 3 58	10.7
Thu May 22/Fri May 23	15 20	18 02	19 18	6 02	7 19	10 36	21 23	2 09	.....	31	23 32.8	0 29	10.7
Fri May 23/Sat May 24	15 23	18 01	19 17	6 03	7 19	10 40	21 27	3 10	.....	22	0 24.4	4 52	10.8
Sat May 24/Sun May 25	15 27	18 01	19 17	6 03	7 20	10 44	21 32	4 10	.....	13	1 15.8	8 57	10.8
Sun May 25/Mon May 26	15 31	18 00	19 17	6 04	7 20	10 47	21 36	5 09	15 59	7	2 07.4	12 32	10.8
Mon May 26/Tue May 27	15 35	18 00	19 17	6 04	7 21	10 51	21 41	6 07	16 41	3	2 59.4	15 28	10.8
Tue May 27/Wed May 28	15 39	18 00	19 16	6 05	7 22	10 55	21 45	7 03	17 25	0	3 51.8	17 37	10.8
Wed May 28/Thu May 29	15 43	17 59	19 16	6 05	7 22	10 59	21 49	7 57	18 12	0	4 44.2	18 52	10.8
Thu May 29/Fri May 30	15 47	17 59	19 16	6 06	7 23	11 02	21 54	.....	19 01	2	5 36.3	19 13	10.8
Fri May 30/Sat May 31	15 51	17 59	19 16	6 06	7 23	11 06	21 58	.....	19 52	6	6 27.5	18 41	10.8
Sat May 31/Sun Jun 01	15 55	17 59	19 16	6 07	7 24	11 10	22 03	.....	20 44	11	7 17.4	17 19	10.8

***** 2014 JUNE *****

Date (eve/morn)	LMST midn	----- Sun: -----				LST twilight:		----- Moon: -----				Twi-Twi hours	
		set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec	
Sun Jun 01/Mon Jun 02	15 59	17 58	19 16	6 07	7 24	11 14	22 07	.....	21 36	17	8 06.0	15 14	10.9
Mon Jun 02/Tue Jun 03	16 03	17 58	19 15	6 07	7 25	11 18	22 11	.....	22 28	25	8 53.2	12 33	10.9
Tue Jun 03/Wed Jun 04	16 07	17 58	19 15	6 08	7 25	11 21	22 16	.....	23 20	33	9 39.4	9 21	10.9
Wed Jun 04/Thu Jun 05	16 11	17 58	19 15	6 08	7 26	11 25	22 20	.....	0 12	43	10 25.0	5 47	10.9
Thu Jun 05/Fri Jun 06	16 15	17 58	19 15	6 09	7 26	11 29	22 24	.....	1 05	52	11 10.7	1 57	10.9
Fri Jun 06/Sat Jun 07	16 19	17 58	19 15	6 09	7 27	11 33	22 29	.....	1 58	62	11 57.2	- 2 03	10.9
Sat Jun 07/Sun Jun 08	16 23	17 58	19 15	6 09	7 27	11 37	22 33	.....	2 53	71	12 45.2	- 6 03	10.9
Sun Jun 08/Mon Jun 09	16 27	17 58	19 15	6 10	7 27	11 41	22 37	.....	3 51	80	13 35.5	- 9 53	10.9
Mon Jun 09/Tue Jun 10	16 30	17 58	19 15	6 10	7 28	11 45	22 42	.....	4 51	88	14 28.7	-13 21	10.9
Tue Jun 10/Wed Jun 11	16 34	17 58	19 15	6 11	7 28	11 49	22 46	15 50	5 52	94	15 25.1	-16 11	10.9
Wed Jun 11/Thu Jun 12	16 38	17 58	19 15	6 11	7 29	11 53	22 50	16 40	6 55	98	16 24.8	-18 05	10.9
Thu Jun 12/Fri Jun 13	16 42	17 58	19 15	6 11	7 29	11 57	22 55	17 36	7 56	100	17 26.9	-18 50	10.9
Fri Jun 13/Sat Jun 14	16 46	17 58	19 15	6 12	7 29	12 01	22 59	18 37	.....	98	18 30.0	-18 16	10.9
Sat Jun 14/Sun Jun 15	16 50	17 58	19 16	6 12	7 30	12 05	23 03	19 42	.....	94	19 32.6	-16 24	10.9
Sun Jun 15/Mon Jun 16	16 54	17 58	19 16	6 12	7 30	12 09	23 07	20 49	.....	87	20 33.4	-13 25	10.9
Mon Jun 16/Tue Jun 17	16 58	17 58	19 16	6 12	7 30	12 13	23 11	21 55	.....	78	21 31.8	- 9 36	10.9
Tue Jun 17/Wed Jun 18	17 02	17 58	19 16	6 13	7 31	12 17	23 16	23 00	.....	67	22 27.7	- 5 15	10.9
Wed Jun 18/Thu Jun 19	17 06	17 58	19 16	6 13	7 31	12 21	23 20	0 03	.....	56	23 21.6	- 0 43	10.9
Thu Jun 19/Fri Jun 20	17 10	17 58	19 16	6 13	7 31	12 25	23 24	1 05	.....	45	0 13.9	3 46	10.9
Fri Jun 20/Sat Jun 21	17 14	17 59	19 17	6 13	7 31	12 30	23 28	2 05	.....	34	1 05.5	7 57	10.9
Sat Jun 21/Sun Jun 22	17 18	17 59	19 17	6 14	7 31	12 34	23 32	3 04	.....	25	1 56.7	11 40	10.9
Sun Jun 22/Mon Jun 23	17 22	17 59	19 17	6 14	7 32	12 38	23 37	4 01	.....	16	2 48.1	14 45	10.9
Mon Jun 23/Tue Jun 24	17 26	17 59	19 17	6 14	7 32	12 42	23 41	4 57	.....	10	3 39.8	17 05	10.9
Tue Jun 24/Wed Jun 25	17 30	18 00	19 18	6 14	7 32	12 46	23 45	5 51	16 09	5	4 31.6	18 35	10.9
Wed Jun 25/Thu Jun 26	17 34	18 00	19 18	6 14	7 32	12 51	23 49	6 42	16 56	1	5 23.2	19 12	10.9
Thu Jun 26/Fri Jun 27	17 38	18 00	19 18	6 14	7 32	12 55	23 53	7 30	17 46	0	6 14.3	18 55	10.9
Fri Jun 27/Sat Jun 28	17 41	18 01	19 18	6 15	7 32	12 59	23 57	8 14	18 37	1	7 04.3	17 49	10.9
Sat Jun 28/Sun Jun 29	17 45	18 01	19 19	6 15	7 32	13 03	0 01	.....	19 29	3	7 53.1	15 58	10.9
Sun Jun 29/Mon Jun 30	17 49	18 01	19 19	6 15	7 32	13 08	0 05	.....	20 21	7	8 40.5	13 28	10.9
Mon Jun 30/Tue Jul 01	17 53	18 02	19 19	6 15	7 32	13 12	0 09	.....	21 13	13	9 26.8	10 27	10.9

Calendar for Cerro Tololo, west longitude (h.m.s) = 4 43 16, latitude (d.m) = -30 09.9
 Rise/set times in Chilean time (4 hr W), for 2215 m above surroundings, DAYLIGHT time used, * shows clock reset.
 Moon info is for local midnight, even if moon is down. Program: John Thorstensen, Dartmouth College.

***** 2014 JULY *****

Date (eve/morn)	LMST midn	----- Sun: -----				LST twilight:		----- Moon: -----				Twi-Twi hours	
		set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec	
Tue Jul 01/Wed Jul 02	17 57	18 02	19 20	6 15	7 32	13 16	0 13	.....	22 05	19	10 12.2	7 01	10.9
Wed Jul 02/Thu Jul 03	18 01	18 02	19 20	6 15	7 32	13 20	0 17	.....	22 57	27	10 57.2	3 19	10.9
Thu Jul 03/Fri Jul 04	18 05	18 03	19 20	6 15	7 32	13 25	0 21	.....	23 49	36	11 42.5	- 0 33	10.9
Fri Jul 04/Sat Jul 05	18 09	18 03	19 21	6 15	7 32	13 29	0 25	.....	0 43	46	12 28.8	- 4 29	10.9
Sat Jul 05/Sun Jul 06	18 13	18 04	19 21	6 15	7 32	13 33	0 29	.....	1 38	56	13 16.8	- 8 18	10.9
Sun Jul 06/Mon Jul 07	18 17	18 04	19 21	6 15	7 32	13 38	0 33	.....	2 35	66	14 07.3	-11 51	10.9
Mon Jul 07/Tue Jul 08	18 21	18 04	19 22	6 15	7 32	13 42	0 37	.....	3 34	76	15 00.9	-14 55	10.9
Tue Jul 08/Wed Jul 09	18 25	18 05	19 22	6 15	7 32	13 46	0 40	.....	4 36	85	15 58.0	-17 14	10.9
Wed Jul 09/Thu Jul 10	18 29	18 05	19 23	6 14	7 32	13 51	0 44	.....	5 37	92	16 58.3	-18 34	10.9
Thu Jul 10/Fri Jul 11	18 33	18 06	19 23	6 14	7 31	13 55	0 48	16 17	6 37	97	18 01.0	-18 40	10.9
Fri Jul 11/Sat Jul 12	18 37	18 06	19 23	6 14	7 31	13 59	0 52	17 21	7 34	100	19 04.8	-17 25	10.8
Sat Jul 12/Sun Jul 13	18 41	18 07	19 24	6 14	7 31	14 04	0 56	18 28	.....	99	20 08.0	-14 53	10.8
Sun Jul 13/Mon Jul 14	18 45	18 07	19 24	6 14	7 31	14 08	0 59	19 37	.....	95	21 09.4	-11 18	10.8
Mon Jul 14/Tue Jul 15	18 48	18 08	19 25	6 14	7 30	14 12	1 03	20 45	.....	89	22 08.5	- 6 59	10.8
Tue Jul 15/Wed Jul 16	18 52	18 08	19 25	6 13	7 30	14 17	1 07	21 51	.....	80	23 05.2	- 2 20	10.8
Wed Jul 16/Thu Jul 17	18 56	18 09	19 26	6 13	7 30	14 21	1 10	22 55	.....	70	23 59.8	2 21	10.8
Thu Jul 17/Fri Jul 18	19 00	18 09	19 26	6 13	7 29	14 26	1 14	23 58	.....	59	0 53.1	6 45	10.8
Fri Jul 18/Sat Jul 19	19 04	18 10	19 27	6 12	7 29	14 30	1 18	0 58	.....	48	1 45.5	10 41	10.8
Sat Jul 19/Sun Jul 20	19 08	18 11	19 27	6 12	7 28	14 34	1 21	1 56	.....	38	2 37.5	13 59	10.8
Sun Jul 20/Mon Jul 21	19 12	18 11	19 27	6 12	7 28	14 39	1 25	2 53	.....	28	3 29.3	16 31	10.7
Mon Jul 21/Tue Jul 22	19 16	18 12	19 28	6 11	7 27	14 43	1 28	3 47	.....	20	4 21.0	18 13	10.7
Tue Jul 22/Wed Jul 23	19 20	18 12	19 28	6 11	7 27	14 48	1 32	4 39	.....	13	5 12.4	19 03	10.7
Wed Jul 23/Thu Jul 24	19 24	18 13	19 29	6 11	7 26	14 52	1 36	5 27	.....	7	6 03.3	19 00	10.7
Thu Jul 24/Fri Jul 25	19 28	18 13	19 29	6 10	7 26	14 56	1 39	6 12	16 33	3	6 53.3	18 08	10.7
Fri Jul 25/Sat Jul 26	19 32	18 14	19 30	6 10	7 25	15 01	1 43	6 54	17 25	1	7 42.1	16 30	10.7
Sat Jul 26/Sun Jul 27	19 36	18 15	19 30	6 09	7 25	15 05	1 46	7 32	18 17	0	8 29.8	14 11	10.6
Sun Jul 27/Mon Jul 28	19 40	18 15	19 31	6 09	7 24	15 10	1 49	.....	19 08	1	9 16.2	11 20	10.6
Mon Jul 28/Tue Jul 29	19 44	18 16	19 31	6 08	7 24	15 14	1 53	.....	20 00	4	10 01.7	8 03	10.6
Tue Jul 29/Wed Jul 30	19 48	18 16	19 32	6 08	7 23	15 18	1 56	.....	20 52	9	10 46.6	4 27	10.6
Wed Jul 30/Thu Jul 31	19 52	18 17	19 32	6 07	7 22	15 23	2 00	.....	21 44	15	11 31.4	0 40	10.6
Thu Jul 31/Fri Aug 01	19 55	18 17	19 33	6 06	7 22	15 27	2 03	.....	22 36	22	12 16.7	- 3 10	10.6

***** 2014 AUGUST *****

Date (eve/morn)	LMST midn	----- Sun: -----				LST twilight:		----- Moon: -----				Twi-Twi hours	
		set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec	
Fri Aug 01/Sat Aug 02	19 59	18 18	19 33	6 06	7 21	15 32	2 06	.....	23 30	31	13 03.2	- 6 56	10.5
Sat Aug 02/Sun Aug 03	20 03	18 19	19 33	6 05	7 20	15 36	2 10	.....	0 25	40	13 51.5	-10 29	10.5
Sun Aug 03/Mon Aug 04	20 07	18 19	19 34	6 05	7 19	15 41	2 13	.....	1 22	51	14 42.4	-13 38	10.5
Mon Aug 04/Tue Aug 05	20 11	18 20	19 34	6 04	7 19	15 45	2 16	.....	2 20	61	15 36.2	-16 11	10.5
Tue Aug 05/Wed Aug 06	20 15	18 20	19 35	6 03	7 18	15 49	2 19	.....	3 20	72	16 33.2	-17 54	10.5
Wed Aug 06/Thu Aug 07	20 19	18 21	19 35	6 03	7 17	15 54	2 23	.....	4 19	81	17 33.1	-18 34	10.5
Thu Aug 07/Fri Aug 08	20 23	18 21	19 36	6 02	7 16	15 58	2 26	.....	5 16	90	18 35.0	-17 59	10.4
Fri Aug 08/Sat Aug 09	20 27	18 22	19 36	6 01	7 15	16 03	2 29	16 05	6 11	96	19 38.1	-16 07	10.4
Sat Aug 09/Sun Aug 10	20 31	18 23	19 37	6 00	7 14	16 07	2 32	17 13	7 02	99	20 40.7	-13 03	10.4
Sun Aug 10/Mon Aug 11	20 35	18 23	19 37	5 59	7 14	16 11	2 35	18 22	7 49	100	21 41.8	- 9 02	10.4
Mon Aug 11/Tue Aug 12	20 39	18 24	19 38	5 59	7 13	16 16	2 39	19 31	.....	97	22 41.1	- 4 25	10.3
Tue Aug 12/Wed Aug 13	20 43	18 24	19 38	5 58	7 12	16 20	2 42	20 38	.....	91	23 38.6	0 25	10.3
Wed Aug 13/Thu Aug 14	20 47	18 25	19 39	5 57	7 11	16 25	2 45	21 43	.....	83	0 34.5	5 06	10.3
Thu Aug 14/Fri Aug 15	20 51	18 25	19 39	5 56	7 10	16 29	2 48	22 47	.....	74	1 29.2	9 21	10.3
Fri Aug 15/Sat Aug 16	20 55	18 26	19 40	5 55	7 09	16 34	2 51	23 47	.....	63	2 23.0	12 57	10.3
Sat Aug 16/Sun Aug 17	20 59	18 27	19 40	5 54	7 08	16 38	2 54	0 46	.....	53	3 16.3	15 47	10.2
Sun Aug 17/Mon Aug 18	21 03	18 27	19 41	5 53	7 07	16 42	2 57	1 42	.....	43	4 09.0	17 45	10.2
Mon Aug 18/Tue Aug 19	21 06	18 28	19 41	5 53	7 06	16 47	3 00	2 35	.....	33	5 01.1	18 49	10.2
Tue Aug 19/Wed Aug 20	21 10	18 28	19 42	5 52	7 05	16 51	3 03	3 24	.....	24	5 52.4	19 00	10.2
Wed Aug 20/Thu Aug 21	21 14	18 29	19 42	5 51	7 04	16 56	3 06	4 10	.....	17	6 42.7	18 20	10.1
Thu Aug 21/Fri Aug 22	21 18	18 29	19 43	5 50	7 03	17 00	3 09	4 53	.....	10	7 31.7	16 53	10.1
Fri Aug 22/Sat Aug 23	21 22	18 30	19 43	5 49	7 02	17 05	3 12	5 33	.....	5	8 19.5	14 46	10.1
Sat Aug 23/Sun Aug 24	21 26	18 30	19 44	5 48	7 01	17 09	3 15	6 10	17 04	2	9 06.2	12 04	10.1
Sun Aug 24/Mon Aug 25	21 30	18 31	19 44	5 47	7 00	17 13	3 18	6 45	17 56	0	9 51.9	8 54	10.0
Mon Aug 25/Tue Aug 26	21 34	18 31	19 44	5 46	6 58	17 18	3 21	7 19	18 48	0	10 37.0	5 24	10.0
Tue Aug 26/Wed Aug 27	21 38	18 32	19 45	5 44	6 57	17 22	3 23	.....	19 40	2	11 21.8	1 41	10.0
Wed Aug 27/Thu Aug 28	21 42	18 33	19 45	5 43	6 56	17 27	3 26	.....	20 32	6	12 07.0	- 2 07	10.0
Thu Aug 28/Fri Aug 29	21 46	18 33	19 46	5 42	6 55	17 31	3 29	.....	21 25	11	12 52.9	- 5 52	9.9
Fri Aug 29/Sat Aug 30	21 50	18 34	19 46	5 41	6 54	17 36	3 32	.....	22 20	18	13 40.3	- 9 25	9.9
Sat Aug 30/Sun Aug 31	21 54	18 34	19 47	5 40	6 53	17 40	3 35	.....	23 15	26	14 29.5	-12 36	9.9
Sun Aug 31/Mon Sep 01	21 58	18 35	19 47	5 39	6 52	17 44	3 38	.....	0 12	36	15 21.1	-15 15	9.9

Calendar for Cerro Tololo, west longitude (h.m.s) = 4 43 16, latitude (d.m) = -30 09.9
 Rise/set times in Chilean time (4 hr W), for 2215 m above surroundings, DAYLIGHT time used, * shows clock reset.
 Moon info is for local midnight, even if moon is down. Program: John Thorstensen, Dartmouth College.

***** 2014 SEPTEMBER *****

Date (eve/morn)	LMST midn	----- Sun: -----				LST twilight:		----- Moon: -----					Twi-Twi hours
		set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec	
Mon Sep 01/Tue Sep 02	22 02	18 35	19 48	5 38	6 50	17 49	3 40	.....	1 09	46	16 15.3	-17 10	9.8
Tue Sep 02/Wed Sep 03	22 06	18 36	19 48	5 37	6 49	17 53	3 43	.....	2 07	57	17 12.1	-18 10	9.8
Wed Sep 03/Thu Sep 04	22 10	18 36	19 49	5 36	6 48	17 58	3 46	.....	3 03	68	18 11.1	-18 05	9.8
Thu Sep 04/Fri Sep 05	22 13	18 37	19 49	5 34	6 47	18 02	3 49	.....	3 57	78	19 11.5	-18 49	9.7
Fri Sep 05/Sat Sep 06	22 17	18 37	19 50	5 33	6 46	18 07	3 52	.....	4 48	87	20 12.5	-14 22	9.7
Sat Sep 06/Sun Sep 07	22 21	18 38	19 50	5 32	6 44	18 11	3 54	.....	5 36	94	21 13.1	-10 52	9.7
Sun Sep 07/Mon Sep 08	22 25	18 38	19 51	5 31	6 43	18 16	3 57	17 06	6 22	99	22 12.8	- 6 34	9.7
Mon Sep 08/Tue Sep 09	22 29	18 39	19 52	5 30	6 42	18 20	4 00	18 15	7 05	100	23 11.5	- 1 49	9.6
Tue Sep 09/Wed Sep 10	22 33	18 39	19 52	5 28	6 41	18 25	4 02	19 22	.....	98	0 09.1	3 01	9.6
Wed Sep 10/Thu Sep 11	22 37	18 40	19 53	5 27	6 40	18 29	4 05	20 28	.....	93	1 05.9	7 35	9.6
Thu Sep 11/Fri Sep 12	22 41	18 41	19 53	5 26	6 38	18 34	4 08	21 31	.....	87	2 01.9	11 35	9.5
Fri Sep 12/Sat Sep 13	22 45	18 41	19 54	5 25	6 37	18 38	4 10	22 33	.....	78	2 57.4	14 49	9.5
Sat Sep 13/Sun Sep 14	22 49	18 42	19 54	5 23	6 36	18 43	4 13	23 32	.....	68	3 52.1	17 09	9.5
Sun Sep 14/Mon Sep 15	22 53	18 42	19 55	5 22	6 35	18 47	4 16	0 27	.....	58	4 46.0	18 32	9.5
Mon Sep 15/Tue Sep 16	22 57	18 43	19 55	5 21	6 33	18 52	4 19	1 19	.....	49	5 38.7	18 58	9.4
Tue Sep 16/Wed Sep 17	23 01	18 43	19 56	5 19	6 32	18 56	4 21	2 07	.....	39	6 30.0	18 32	9.4
Wed Sep 17/Thu Sep 18	23 05	18 44	19 56	5 18	6 31	19 01	4 24	2 51	.....	30	7 19.8	17 17	9.4
Thu Sep 18/Fri Sep 19	23 09	18 44	19 57	5 17	6 30	19 05	4 26	3 32	.....	22	8 08.2	15 19	9.3
Fri Sep 19/Sat Sep 20	23 13	18 45	19 58	5 16	6 28	19 10	4 29	4 10	.....	14	8 55.2	12 46	9.3
Sat Sep 20/Sun Sep 21	23 17	18 45	19 58	5 14	6 27	19 14	4 32	4 45	.....	9	9 41.2	9 44	9.3
Sun Sep 21/Mon Sep 22	23 21	18 46	19 59	5 13	6 26	19 19	4 34	5 20	16 43	4	10 26.5	6 19	9.2
Mon Sep 22/Tue Sep 23	23 24	18 47	19 59	5 12	6 25	19 23	4 37	5 54	17 35	1	11 11.6	2 40	9.2
Tue Sep 23/Wed Sep 24	23 28	18 47	20 00	5 10	6 23	19 28	4 40	6 28	18 27	0	11 56.9	- 1 07	9.2
Wed Sep 24/Thu Sep 25	23 32	18 48	20 01	5 09	6 22	19 32	4 42	7 02	19 21	1	12 42.9	- 4 54	9.1
Thu Sep 25/Fri Sep 26	23 36	18 48	20 01	5 08	6 21	19 37	4 45	.....	20 15	3	13 30.1	- 8 30	9.1
Fri Sep 26/Sat Sep 27	23 40	18 49	20 02	5 06	6 20	19 42	4 47	.....	21 10	8	14 19.0	-11 46	9.1
Sat Sep 27/Sun Sep 28	23 44	18 49	20 03	5 05	6 18	19 46	4 50	.....	22 07	14	15 09.9	-14 31	9.0
Sun Sep 28/Mon Sep 29	23 48	18 50	20 03	5 04	6 17	19 51	4 53	.....	23 04	22	16 02.9	-16 35	9.0
Mon Sep 29/Tue Sep 30	23 52	18 50	20 04	5 02	6 16	19 55	4 55	.....	0 01	32	16 58.0	-17 48	9.0
Tue Sep 30/Wed Oct 01	23 56	18 51	20 05	5 01	6 15	20 00	4 58	.....	0 56	42	17 54.8	-18 00	8.9

***** 2014 OCTOBER *****

Date (eve/morn)	LMST midn	----- Sun: -----				LST twilight:		----- Moon: -----					Twi-Twi hours
		set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec	
Wed Oct 01/Thu Oct 02	24 00	18 52	20 05	5 00	6 13	20 05	5 00	.....	1 49	53	18 52.8	-17 07	8.9
Thu Oct 02/Fri Oct 03	0 04	18 52	20 06	4 58	6 12	20 09	5 03	.....	2 40	65	19 51.3	-15 08	8.9
Fri Oct 03/Sat Oct 04	0 08	18 53	20 07	4 57	6 11	20 14	5 06	.....	3 27	75	20 49.8	-12 08	8.8
Sat Oct 04/Sun Oct 05	0 12	18 53	20 08	4 56	6 10	20 19	5 08	.....	4 12	85	21 47.8	- 8 16	8.8
Sun Oct 05/Mon Oct 06	0 16	18 54	20 08	4 54	6 08	20 23	5 11	.....	4 56	93	22 45.3	- 3 49	8.8
Mon Oct 06/Tue Oct 07	0 20	18 55	20 09	4 53	6 07	20 28	5 13	17 00	5 38	98	23 42.4	0 56	8.7
Tue Oct 07/Wed Oct 08	0 24	18 55	20 10	4 52	6 06	20 33	5 16	18 05	6 21	100	0 39.2	5 37	8.7
Wed Oct 08/Thu Oct 09	0 28	18 56	20 11	4 50	6 05	20 37	5 19	19 11	.....	99	1 36.0	9 55	8.7
Thu Oct 09/Fri Oct 10	0 31	18 57	20 11	4 49	6 04	20 42	5 21	20 14	.....	96	2 32.8	13 34	8.6
Fri Oct 10/Sat Oct 11	0 35	18 57	20 12	4 48	6 03	20 47	5 24	21 16	.....	90	3 29.3	16 22	8.6
Sat Oct 11/Sun Oct 12*	0 39	18 58	20 13	4 46	6 01	20 52	5 27	22 15	.....	83	4 25.2	18 10	8.6
Sun Oct 12/Mon Oct 13	23 43	19 59	21 14	5 45	7 00	20 56	5 29	0 09	.....	75	5 17.9	18 54	8.5
Mon Oct 13/Tue Oct 14	23 47	19 59	21 15	5 44	6 59	21 01	5 32	1 00	.....	65	6 11.0	18 47	8.5
Tue Oct 14/Wed Oct 15	23 51	20 00	21 15	5 42	6 58	21 06	5 34	1 46	.....	56	7 02.3	17 48	8.5
Wed Oct 15/Thu Oct 16	23 55	20 01	21 16	5 41	6 57	21 11	5 37	2 29	.....	46	7 51.8	16 04	8.4
Thu Oct 16/Fri Oct 17	23 59	20 01	21 17	5 40	6 56	21 16	5 40	3 08	.....	37	8 39.6	13 42	8.4
Fri Oct 17/Sat Oct 18	0 03	20 02	21 18	5 39	6 55	21 20	5 42	3 44	.....	28	9 26.1	10 48	8.3
Sat Oct 18/Sun Oct 19	0 07	20 03	21 19	5 37	6 54	21 25	5 45	4 19	.....	20	10 11.6	7 31	8.3
Sun Oct 19/Mon Oct 20	0 11	20 03	21 20	5 36	6 53	21 30	5 48	4 53	.....	13	10 56.7	3 55	8.3
Mon Oct 20/Tue Oct 21	0 15	20 04	21 21	5 35	6 51	21 35	5 50	5 27	17 20	8	11 41.9	0 10	8.2
Tue Oct 21/Wed Oct 22	0 19	20 05	21 22	5 34	6 50	21 40	5 53	6 02	18 13	3	12 27.8	- 3 38	8.2
Wed Oct 22/Thu Oct 23	0 23	20 05	21 23	5 32	6 49	21 45	5 56	6 38	19 07	1	13 15.0	- 7 20	8.2
Thu Oct 23/Fri Oct 24	0 27	20 06	21 24	5 31	6 48	21 50	5 59	.....	20 03	0	14 03.9	-10 46	8.1
Fri Oct 24/Sat Oct 25	0 30	20 07	21 24	5 30	6 47	21 55	6 01	.....	21 00	1	14 54.9	-13 44	8.1
Sat Oct 25/Sun Oct 26	0 34	20 08	21 25	5 29	6 46	21 59	6 04	.....	21 58	5	15 48.0	-16 03	8.1
Sun Oct 26/Mon Oct 27	0 38	20 08	21 26	5 28	6 46	22 04	6 07	.....	22 56	11	16 43.0	-17 31	8.0
Mon Oct 27/Tue Oct 28	0 42	20 09	21 27	5 26	6 45	22 09	6 10	.....	23 52	18	17 39.7	-18 01	8.0
Tue Oct 28/Wed Oct 29	0 46	20 10	21 28	5 25	6 44	22 14	6 12	.....	0 46	28	18 37.2	-17 26	7.9
Wed Oct 29/Thu Oct 30	0 50	20 11	21 29	5 24	6 43	22 19	6 15	.....	1 37	38	19 34.8	-15 46	7.9
Thu Oct 30/Fri Oct 31	0 54	20 12	21 30	5 23	6 42	22 24	6 18	.....	2 24	50	20 32.1	-13 07	7.9
Fri Oct 31/Sat Nov 01	0 58	20 12	21 32	5 22	6 41	22 29	6 21	.....	3 09	61	21 28.6	- 9 36	7.8

Calendar for Cerro Tololo, west longitude (h.m.s) = 4 43 16, latitude (d.m) = -30 09.9
 Rise/set times in Chilean time (4 hr W), for 2215 m above surroundings, DAYLIGHT time used, * shows clock reset.
 Moon info is for local midnight, even if moon is down. Program: John Thorstensen, Dartmouth College.

***** 2014 NOVEMBER *****

Date (eve/morn)	LMST midn	----- Sun: -----				LST twilight:		----- Moon: -----				RA	Dec	Twi-Twi hours
		set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum				
Sat Nov 01/Sun Nov 02	1 02	20 13	21 33	5 21	6 40	22 34	6 24	.....	3 51	72	22 24.3	- 5 28	7.8
Sun Nov 02/Mon Nov 03	1 06	20 14	21 34	5 20	6 39	22 39	6 27	.....	4 32	82	23 19.6	- 0 57	7.8
Mon Nov 03/Tue Nov 04	1 10	20 15	21 35	5 19	6 39	22 44	6 29	.....	5 14	90	0 14.9	3 40	7.7
Tue Nov 04/Wed Nov 05	1 14	20 16	21 36	5 18	6 38	22 49	6 32	17 52	5 56	96	1 10.4	8 05	7.7	
Wed Nov 05/Thu Nov 06	1 18	20 16	21 37	5 17	6 37	22 54	6 35	18 56	6 39	99	2 06.4	12 02	7.7	
Thu Nov 06/Fri Nov 07	1 22	20 17	21 38	5 16	6 36	22 59	6 38	19 58	.....	100	3 02.8	15 15	7.6
Fri Nov 07/Sat Nov 08	1 26	20 18	21 39	5 15	6 36	23 04	6 41	20 58	.....	98	3 59.4	17 33	7.6
Sat Nov 08/Sun Nov 09	1 30	20 19	21 40	5 14	6 35	23 09	6 44	21 56	.....	94	4 55.5	18 51	7.6
Sun Nov 09/Mon Nov 10	1 34	20 20	21 41	5 13	6 34	23 14	6 47	22 49	.....	88	5 50.5	19 07	7.5
Mon Nov 10/Tue Nov 11	1 37	20 21	21 42	5 12	6 34	23 19	6 50	23 39	.....	81	6 43.7	18 27	7.5
Tue Nov 11/Wed Nov 12	1 41	20 21	21 43	5 11	6 33	23 24	6 53	0 24	.....	73	7 35.0	16 57	7.5
Wed Nov 12/Thu Nov 13	1 45	20 22	21 45	5 10	6 32	23 30	6 56	1 05	.....	64	8 24.2	14 44	7.4
Thu Nov 13/Fri Nov 14	1 49	20 23	21 46	5 09	6 32	23 35	6 59	1 42	.....	54	9 11.6	11 58	7.4
Fri Nov 14/Sat Nov 15	1 53	20 24	21 47	5 08	6 31	23 40	7 03	2 18	.....	45	9 57.6	8 46	7.4
Sat Nov 15/Sun Nov 16	1 57	20 25	21 48	5 08	6 31	23 45	7 06	2 52	.....	36	10 42.8	5 15	7.3
Sun Nov 16/Mon Nov 17	2 01	20 26	21 49	5 07	6 30	23 50	7 09	3 25	.....	27	11 27.8	1 32	7.3
Mon Nov 17/Tue Nov 18	2 05	20 27	21 50	5 06	6 30	23 55	7 12	3 59	.....	19	12 13.3	- 2 16	7.3
Tue Nov 18/Wed Nov 19	2 09	20 27	21 51	5 06	6 29	24 00	7 15	4 35	.....	12	12 59.9	- 6 01	7.2
Wed Nov 19/Thu Nov 20	2 13	20 28	21 52	5 05	6 29	0 05	7 19	5 13	17 52	6	13 48.2	- 9 34	7.2	
Thu Nov 20/Fri Nov 21	2 17	20 29	21 54	5 04	6 29	0 10	7 22	5 54	18 49	2	14 38.7	-12 45	7.2	
Fri Nov 21/Sat Nov 22	2 21	20 30	21 55	5 04	6 28	0 15	7 25	.....	19 47	0	15 31.7	-15 20	7.1
Sat Nov 22/Sun Nov 23	2 25	20 31	21 56	5 03	6 28	0 20	7 29	.....	20 46	1	16 27.1	-17 08	7.1
Sun Nov 23/Mon Nov 24	2 29	20 32	21 57	5 03	6 28	0 25	7 32	.....	21 45	3	17 24.4	-17 57	7.1
Mon Nov 24/Tue Nov 25	2 33	20 33	21 58	5 02	6 27	0 30	7 36	.....	22 41	8	18 22.8	-17 40	7.1
Tue Nov 25/Wed Nov 26	2 37	20 34	21 59	5 02	6 27	0 35	7 39	.....	23 34	15	19 21.3	-16 17	7.0
Wed Nov 26/Thu Nov 27	2 41	20 34	22 00	5 01	6 27	0 40	7 42	.....	0 23	24	20 19.0	-13 50	7.0
Thu Nov 27/Fri Nov 28	2 45	20 35	22 01	5 01	6 27	0 45	7 46	.....	1 09	35	21 15.6	-10 32	7.0
Fri Nov 28/Sat Nov 29	2 48	20 36	22 02	5 00	6 27	0 50	7 50	.....	1 52	46	22 10.9	- 6 34	7.0
Sat Nov 29/Sun Nov 30	2 52	20 37	22 03	5 00	6 26	0 55	7 53	.....	2 32	58	23 05.2	- 2 12	6.9
Sun Nov 30/Mon Dec 01	2 56	20 38	22 04	5 00	6 26	1 00	7 57	.....	3 12	69	23 59.0	2 19	6.9

***** 2014 DECEMBER *****

Date (eve/morn)	LMST midn	----- Sun: -----				LST twilight:		----- Moon: -----				RA	Dec	Twi-Twi hours
		set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum				
Mon Dec 01/Tue Dec 02	3 00	20 39	22 05	4 59	6 26	1 05	8 01	.....	3 53	79	0 52.8	6 43	6.9
Tue Dec 02/Wed Dec 03	3 04	20 39	22 06	4 59	6 26	1 10	8 04	.....	4 34	87	1 47.0	10 46	6.9
Wed Dec 03/Thu Dec 04	3 08	20 40	22 07	4 59	6 26	1 15	8 08	17 45	5 18	94	2 41.9	14 13	6.9	
Thu Dec 04/Fri Dec 05	3 12	20 41	22 08	4 59	6 26	1 20	8 12	18 45	6 05	98	3 37.5	16 52	6.8	
Fri Dec 05/Sat Dec 06	3 16	20 42	22 09	4 59	6 26	1 25	8 16	19 43	.....	100	4 33.4	18 35	6.8
Sat Dec 06/Sun Dec 07	3 20	20 43	22 10	4 59	6 26	1 30	8 19	20 38	.....	99	5 29.0	19 18	6.8
Sun Dec 07/Mon Dec 08	3 24	20 43	22 11	4 59	6 27	1 35	8 23	21 30	.....	97	6 23.4	19 01	6.8
Mon Dec 08/Tue Dec 09	3 28	20 44	22 12	4 59	6 27	1 40	8 27	22 17	.....	93	7 16.2	17 50	6.8
Tue Dec 09/Wed Dec 10	3 32	20 45	22 13	4 59	6 27	1 45	8 31	23 00	.....	87	8 07.0	15 51	6.8
Wed Dec 10/Thu Dec 11	3 36	20 45	22 14	4 59	6 27	1 49	8 35	23 40	.....	80	8 55.7	13 15	6.7
Thu Dec 11/Fri Dec 12	3 40	20 46	22 15	4 59	6 27	1 54	8 39	0 16	.....	71	9 42.7	10 09	6.7
Fri Dec 12/Sat Dec 13	3 44	20 47	22 15	4 59	6 28	1 59	8 43	0 51	.....	63	10 28.3	6 43	6.7
Sat Dec 13/Sun Dec 14	3 48	20 48	22 16	4 59	6 28	2 03	8 48	1 24	.....	53	11 13.3	3 03	6.7
Sun Dec 14/Mon Dec 15	3 52	20 48	22 17	4 59	6 28	2 08	8 52	1 57	.....	44	11 58.3	- 0 43	6.7
Mon Dec 15/Tue Dec 16	3 55	20 49	22 18	5 00	6 29	2 13	8 56	2 31	.....	35	12 44.0	- 4 29	6.7
Tue Dec 16/Wed Dec 17	3 59	20 49	22 18	5 00	6 29	2 17	9 00	3 07	.....	26	13 31.0	- 8 07	6.7
Wed Dec 17/Thu Dec 18	4 03	20 50	22 19	5 00	6 29	2 22	9 05	3 46	.....	18	14 20.2	-11 27	6.7
Thu Dec 18/Fri Dec 19	4 07	20 51	22 20	5 01	6 30	2 27	9 09	4 29	17 31	10	15 11.9	-14 18	6.7	
Fri Dec 19/Sat Dec 20	4 11	20 51	22 20	5 01	6 30	2 31	9 13	5 18	18 30	5	16 06.3	-16 27	6.7	
Sat Dec 20/Sun Dec 21	4 15	20 52	22 21	5 02	6 31	2 36	9 18	6 11	19 30	1	17 03.4	-17 43	6.7	
Sun Dec 21/Mon Dec 22	4 19	20 52	22 21	5 02	6 31	2 40	9 22	.....	20 29	0	18 02.4	-17 53	6.7
Mon Dec 22/Tue Dec 23	4 23	20 53	22 22	5 03	6 32	2 44	9 27	.....	21 25	2	19 02.3	-16 53	6.7
Tue Dec 23/Wed Dec 24	4 27	20 53	22 22	5 03	6 32	2 49	9 31	.....	22 18	6	20 01.9	-14 46	6.7
Wed Dec 24/Thu Dec 25	4 31	20 54	22 23	5 04	6 33	2 53	9 36	.....	23 06	12	21 00.3	-11 39	6.7
Thu Dec 25/Fri Dec 26	4 35	20 54	22 23	5 04	6 33	2 58	9 40	.....	23 51	21	21 57.2	- 7 47	6.7
Fri Dec 26/Sat Dec 27	4 39	20 54	22 23	5 05	6 34	3 02	9 45	.....	0 33	31	22 52.5	- 3 27	6.7
Sat Dec 27/Sun Dec 28	4 43	20 55	22 24	5 06	6 35	3 06	9 49	.....	1 14	42	23 46.6	1 04	6.7
Sun Dec 28/Mon Dec 29	4 47	20 55	22 24	5 07	6 35	3 10	9 54	.....	1 54	54	0 40.0	5 30	6.7
Mon Dec 29/Tue Dec 30	4 51	20 55	22 24	5 07	6 36	3 14	9 59	.....	2 35	64	1 33.4	9 37	6.7
Tue Dec 30/Wed Dec 31	4 55	20 56	22 24	5 08	6 37	3 19	10 04	.....	3 17	75	2 27.0	13 12	6.7
Wed Dec 31/Thu Jan 01	4 59	20 56	22 24	5 09	6 37	3 23	10 08	.....	4 01	83	3 21.2	16 05	6.7