

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:

***** 2022 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 NAOA 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 2022, 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 04	4 45	Dec 10	22 38	Dec 19	1 38	Dec 26	23 26
Jan 02	15 36	Jan 09	15 13	Jan 17	20 51	Jan 25	10 43
Feb 01	2 49	Feb 08	10 52	Feb 16	14 00	Feb 23	19 35
Mar 02	14 38	Mar 10	7 46	Mar 18	3 21	Mar 25	1 39
Apr 01	2 28	Apr 09	2 48	Apr 16	14 58	Apr 23	7 58
Apr 30	16 31	May 08	20 22	May 16	0 16	May 22	14 45
May 30	7 32	Jun 07	10 49	Jun 14	7 53	Jun 20	23 12
Jun 28	22 53	Jul 06	22 15	Jul 13	14 38	Jul 20	10 19
Jul 28	13 55	Aug 05	7 08	Aug 11	21 36	Aug 19	0 37
Aug 27	4 17	Sep 03	14 09	Sep 10	5 59	Sep 17	17 52
Sep 25	17 54	Oct 02	20 15	Oct 09	17 55	Oct 17	14 16
Oct 25	7 48	Nov 01	3 39	Nov 08	8 03	Nov 16	10 29
Nov 23	19 57	Nov 30	11 39	Dec 08	1 10	Dec 16	5 59
Dec 23	7 18	Dec 29	22 23	Jan 06	20 10	Jan 14	23 13

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.

***** 2022 JANUARY *****

Date (eve/morn)	LMST midn	----- Sun: -----				LST twilight:		----- Moon: -----				Twi-Twi	
		set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec	hours
Sat Jan 01/Sun Jan 02	5 04	20 56	22 24	5 10	6 38	3 28	10 15	6 10	20 10	1	18 10.1	-25 17	6.8
Sun Jan 02/Mon Jan 03	5 08	20 56	22 25	5 11	6 39	3 32	10 19	.....	21 17	0	19 16.6	-25 13	6.8
Mon Jan 03/Tue Jan 04	5 12	20 57	22 25	5 12	6 40	3 36	10 24	.....	22 16	3	20 21.4	-23 17	6.8
Tue Jan 04/Wed Jan 05	5 16	20 57	22 25	5 13	6 40	3 40	10 29	.....	23 05	8	21 22.4	-19 48	6.8
Wed Jan 05/Thu Jan 06	5 19	20 57	22 24	5 14	6 41	3 44	10 34	.....	23 47	15	22 18.7	-15 11	6.8
Thu Jan 06/Fri Jan 07	5 23	20 57	22 24	5 15	6 42	3 48	10 39	.....	0 22	24	23 10.6	- 9 52	6.8
Fri Jan 07/Sat Jan 08	5 27	20 57	22 24	5 16	6 43	3 51	10 44	.....	0 54	33	23 59.2	- 4 14	6.9
Sat Jan 08/Sun Jan 09	5 31	20 57	22 24	5 17	6 44	3 55	10 49	.....	1 23	43	0 45.4	1 27	6.9
Sun Jan 09/Mon Jan 10	5 35	20 57	22 24	5 18	6 45	3 59	10 54	.....	1 52	53	1 30.6	6 57	6.9
Mon Jan 10/Tue Jan 11	5 39	20 57	22 24	5 19	6 45	4 03	10 59	.....	2 21	63	2 15.8	12 07	6.9
Tue Jan 11/Wed Jan 12	5 43	20 57	22 23	5 20	6 46	4 06	11 04	.....	2 53	72	3 01.8	16 46	6.9
Wed Jan 12/Thu Jan 13	5 47	20 57	22 23	5 21	6 47	4 10	11 09	.....	3 27	80	3 49.4	20 44	7.0
Thu Jan 13/Fri Jan 14	5 51	20 57	22 23	5 22	6 48	4 13	11 14	.....	4 06	87	4 39.1	23 53	7.0
Fri Jan 14/Sat Jan 15	5 55	20 56	22 22	5 23	6 49	4 17	11 19	18 20	4 49	93	5 30.9	26 01	7.0
Sat Jan 15/Sun Jan 16	5 59	20 56	22 22	5 24	6 50	4 21	11 24	19 14	5 38	97	6 24.3	27 00	7.0
Sun Jan 16/Mon Jan 17	6 03	20 56	22 21	5 25	6 51	4 24	11 29	20 05	.....	99	7 18.5	26 45	7.1
Mon Jan 17/Tue Jan 18	6 07	20 56	22 21	5 26	6 52	4 27	11 34	20 52	.....	100	8 12.3	25 14	7.1
Tue Jan 18/Wed Jan 19	6 11	20 56	22 20	5 28	6 52	4 31	11 39	21 35	.....	98	9 05.0	22 31	7.1
Wed Jan 19/Thu Jan 20	6 15	20 55	22 20	5 29	6 53	4 34	11 44	22 13	.....	95	9 55.9	18 47	7.1
Thu Jan 20/Fri Jan 21	6 19	20 55	22 19	5 30	6 54	4 38	11 49	22 47	.....	90	10 45.0	14 11	7.2
Fri Jan 21/Sat Jan 22	6 23	20 55	22 19	5 31	6 55	4 41	11 54	23 19	.....	83	11 32.8	8 57	7.2
Sat Jan 22/Sun Jan 23	6 26	20 54	22 18	5 32	6 56	4 44	12 00	23 50	.....	75	12 20.0	3 17	7.2
Sun Jan 23/Mon Jan 24	6 30	20 54	22 17	5 33	6 57	4 48	12 05	0 21	.....	65	13 07.5	- 2 35	7.3
Mon Jan 24/Tue Jan 25	6 34	20 53	22 17	5 35	6 58	4 51	12 10	0 53	.....	54	13 56.4	- 8 24	7.3
Tue Jan 25/Wed Jan 26	6 38	20 53	22 16	5 36	6 59	4 54	12 15	1 28	.....	43	14 47.8	-13 53	7.3
Wed Jan 26/Thu Jan 27	6 42	20 52	22 15	5 37	7 00	4 57	12 20	2 08	.....	32	15 42.8	-18 43	7.4
Thu Jan 27/Fri Jan 28	6 46	20 52	22 15	5 38	7 01	5 00	12 25	2 55	.....	22	16 41.7	-22 31	7.4
Fri Jan 28/Sat Jan 29	6 50	20 51	22 14	5 39	7 01	5 04	12 30	3 50	17 48	13	17 44.4	-24 53	7.4
Sat Jan 29/Sun Jan 30	6 54	20 51	22 13	5 40	7 02	5 07	12 35	4 54	18 56	6	18 49.2	-25 31	7.5
Sun Jan 30/Mon Jan 31	6 58	20 50	22 12	5 42	7 03	5 10	12 41	6 04	19 58	2	19 53.9	-24 19	7.5
Mon Jan 31/Tue Feb 01	7 02	20 50	22 11	5 43	7 04	5 13	12 46	.....	20 51	0	20 56.2	-21 25	7.5

***** 2022 FEBRUARY *****

Date (eve/morn)	LMST midn	----- Sun: -----				LST twilight:		----- Moon: -----				Twi-Twi	
		set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec	hours
Tue Feb 01/Wed Feb 02	7 06	20 49	22 10	5 44	7 05	5 16	12 51	.....	21 37	1	21 54.6	-17 10	7.6
Wed Feb 02/Thu Feb 03	7 10	20 48	22 09	5 45	7 06	5 19	12 56	.....	22 16	5	22 48.9	-12 00	7.6
Thu Feb 03/Fri Feb 04	7 14	20 48	22 08	5 46	7 07	5 22	13 01	.....	22 50	10	23 39.5	- 6 20	7.6
Fri Feb 04/Sat Feb 05	7 18	20 47	22 07	5 47	7 08	5 25	13 06	.....	23 21	18	0 27.5	- 0 30	7.7
Sat Feb 05/Sun Feb 06	7 22	20 46	22 06	5 48	7 09	5 28	13 11	.....	23 51	26	1 13.9	5 14	7.7
Sun Feb 06/Mon Feb 07	7 26	20 46	22 05	5 50	7 09	5 31	13 16	.....	0 21	36	1 59.7	10 37	7.7
Mon Feb 07/Tue Feb 08	7 30	20 45	22 04	5 51	7 10	5 34	13 21	.....	0 52	45	2 45.9	15 31	7.8
Tue Feb 08/Wed Feb 09	7 34	20 44	22 03	5 52	7 11	5 37	13 26	.....	1 25	55	3 33.3	19 45	7.8
Wed Feb 09/Thu Feb 10	7 37	20 43	22 02	5 53	7 12	5 39	13 31	.....	2 02	64	4 22.4	23 10	7.8
Thu Feb 10/Fri Feb 11	7 41	20 42	22 01	5 54	7 13	5 42	13 36	.....	2 44	73	5 13.5	25 38	7.9
Fri Feb 11/Sat Feb 12	7 45	20 42	22 00	5 55	7 14	5 45	13 41	.....	3 31	81	6 06.4	26 58	7.9
Sat Feb 12/Sun Feb 13	7 49	20 41	21 59	5 56	7 15	5 48	13 46	17 59	4 22	88	7 00.4	27 05	8.0
Sun Feb 13/Mon Feb 14	7 53	20 40	21 58	5 57	7 15	5 51	13 51	18 47	5 18	93	7 54.6	25 56	8.0
Mon Feb 14/Tue Feb 15	7 57	20 39	21 57	5 58	7 16	5 54	13 56	19 32	6 16	97	8 48.0	23 32	8.0
Tue Feb 15/Wed Feb 16	8 01	20 38	21 56	5 59	7 17	5 56	14 01	20 12	.....	99	9 40.1	20 00	8.1
Wed Feb 16/Thu Feb 17	8 05	20 37	21 55	6 00	7 18	5 59	14 06	20 48	.....	100	10 30.6	15 31	8.1
Thu Feb 17/Fri Feb 18	8 09	20 36	21 53	6 01	7 19	6 02	14 11	21 21	.....	98	11 19.6	10 17	8.1
Fri Feb 18/Sat Feb 19	8 13	20 35	21 52	6 02	7 19	6 05	14 16	21 52	.....	93	12 07.8	4 33	8.2
Sat Feb 19/Sun Feb 20	8 17	20 34	21 51	6 03	7 20	6 07	14 21	22 23	.....	87	12 56.0	- 1 26	8.2
Sun Feb 20/Mon Feb 21	8 21	20 33	21 50	6 04	7 21	6 10	14 26	22 55	.....	79	13 45.0	- 7 24	8.2
Mon Feb 21/Tue Feb 22	8 25	20 32	21 49	6 05	7 22	6 13	14 31	23 28	.....	69	14 36.0	-13 02	8.3
Tue Feb 22/Wed Feb 23	8 29	20 31	21 47	6 06	7 23	6 16	14 36	0 06	.....	59	15 29.8	-18 01	8.3
Wed Feb 23/Thu Feb 24	8 33	20 30	21 46	6 07	7 23	6 18	14 41	0 50	.....	47	16 27.0	-22 02	8.4
Thu Feb 24/Fri Feb 25	8 37	20 29	21 45	6 08	7 24	6 21	14 46	1 40	.....	36	17 27.5	-24 42	8.4
Fri Feb 25/Sat Feb 26	8 41	20 28	21 44	6 09	7 25	6 24	14 51	2 39	.....	26	18 30.1	-25 46	8.4
Sat Feb 26/Sun Feb 27	8 44	20 27	21 42	6 10	7 26	6 26	14 56	3 45	17 46	16	19 33.2	-25 06	8.5
Sun Feb 27/Mon Feb 28	8 48	20 26	21 41	6 11	7 26	6 29	15 00	4 54	18 41	9	20 34.8	-22 46	8.5
Mon Feb 28/Tue Mar 01	8 52	20 25	21 40	6 12	7 27	6 32	15 05	6 03	19 29	3	21 33.2	-19 00	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.

***** 2022 MARCH *****

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 Mar 01/Wed Mar 02	8 56	20 24	21 39	6 13	7 28	6 34	15 10	.....	20 09	1	22 28.1	-14 09	8.6
Wed Mar 02/Thu Mar 03	9 00	20 22	21 37	6 14	7 28	6 37	15 15	.....	20 45	0	23 19.6	- 8 37	8.6
Thu Mar 03/Fri Mar 04	9 04	20 21	21 36	6 14	7 29	6 40	15 20	.....	21 17	2	0 08.5	- 2 45	8.6
Fri Mar 04/Sat Mar 05	9 08	20 20	21 35	6 15	7 30	6 42	15 24	.....	21 48	7	0 55.6	3 07	8.7
Sat Mar 05/Sun Mar 06	9 12	20 19	21 33	6 16	7 31	6 45	15 29	.....	22 18	12	1 42.0	8 46	8.7
Sun Mar 06/Mon Mar 07	9 16	20 18	21 32	6 17	7 31	6 48	15 34	.....	22 49	20	2 28.5	13 57	8.7
Mon Mar 07/Tue Mar 08	9 20	20 17	21 31	6 18	7 32	6 50	15 39	.....	23 22	28	3 15.9	18 30	8.8
Tue Mar 08/Wed Mar 09	9 24	20 16	21 29	6 19	7 33	6 53	15 44	.....	23 58	37	4 04.7	22 16	8.8
Wed Mar 09/Thu Mar 10	9 28	20 14	21 28	6 19	7 33	6 56	15 48	.....	0 38	46	4 55.3	25 04	8.9
Thu Mar 10/Fri Mar 11	9 32	20 13	21 27	6 20	7 34	6 58	15 53	.....	1 22	56	5 47.5	26 48	8.9
Fri Mar 11/Sat Mar 12	9 36	20 12	21 26	6 21	7 35	7 01	15 58	.....	2 12	65	6 40.9	27 20	8.9
Sat Mar 12/Sun Mar 13*	9 40	20 11	21 24	5 22	6 35	7 04	16 02	.....	2 06	74	7 34.8	26 36	9.0
Sun Mar 13/Mon Mar 14	10 44	19 10	20 23	5 22	6 36	7 06	16 07	.....	3 03	82	8 29.7	24 29	9.0
Mon Mar 14/Tue Mar 15	10 48	19 08	20 22	5 23	6 37	7 09	16 12	17 08	4 02	89	9 22.1	21 18	9.0
Tue Mar 15/Wed Mar 16	10 52	19 07	20 20	5 24	6 37	7 11	16 16	17 46	5 02	95	10 13.2	17 04	9.1
Wed Mar 16/Thu Mar 17	10 56	19 06	20 19	5 25	6 38	7 14	16 21	18 20	6 02	98	11 03.1	11 57	9.1
Thu Mar 17/Fri Mar 18	11 00	19 05	20 18	5 25	6 38	7 17	16 26	18 52	7 02	100	11 52.3	6 11	9.1
Fri Mar 18/Sat Mar 19	11 03	19 04	20 17	5 26	6 39	7 19	16 30	19 23	.....	99	12 41.6	0 02	9.2
Sat Mar 19/Sun Mar 20	11 07	19 02	20 15	5 27	6 40	7 22	16 35	19 55	.....	96	13 31.7	- 6 11	9.2
Sun Mar 20/Mon Mar 21	11 11	19 01	20 14	5 27	6 40	7 25	16 40	20 29	.....	90	14 23.8	-12 10	9.2
Mon Mar 21/Tue Mar 22	11 15	19 00	20 13	5 28	6 41	7 27	16 44	21 05	.....	82	15 18.5	-17 30	9.3
Tue Mar 22/Wed Mar 23	11 19	18 59	20 11	5 29	6 42	7 30	16 49	21 48	.....	72	16 16.3	-21 50	9.3
Wed Mar 23/Thu Mar 24	11 23	18 57	20 10	5 29	6 42	7 33	16 54	22 36	.....	61	17 17.1	-24 49	9.3
Thu Mar 24/Fri Mar 25	11 27	18 56	20 09	5 30	6 43	7 35	16 58	23 33	.....	50	18 19.8	-26 10	9.4
Fri Mar 25/Sat Mar 26	11 31	18 55	20 08	5 31	6 43	7 38	17 03	0 35	.....	39	19 22.6	-25 46	9.4
Sat Mar 26/Sun Mar 27	11 35	18 54	20 06	5 31	6 44	7 41	17 07	1 42	.....	28	20 23.7	-23 43	9.4
Sun Mar 27/Mon Mar 28	11 39	18 53	20 05	5 32	6 45	7 44	17 12	2 50	.....	19	21 21.6	-20 15	9.4
Mon Mar 28/Tue Mar 29	11 43	18 51	20 04	5 33	6 45	7 46	17 16	3 56	17 07	11	22 16.0	-15 40	9.5
Tue Mar 29/Wed Mar 30	11 47	18 50	20 03	5 33	6 46	7 49	17 21	5 00	17 43	5	23 07.0	-10 21	9.5
Wed Mar 30/Thu Mar 31	11 51	18 49	20 02	5 34	6 46	7 52	17 26	6 01	18 16	1	23 55.5	- 4 36	9.5
Thu Mar 31/Fri Apr 01	11 55	18 48	20 00	5 35	6 47	7 54	17 30	7 00	18 46	0	0 42.3	1 16	9.6

***** 2022 APRIL *****

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 Apr 01/Sat Apr 02	11 59	18 47	19 59	5 35	6 48	7 57	17 35	.....	19 16	1	1 28.4	6 59	9.6
Sat Apr 02/Sun Apr 03	12 03	18 45	19 58	5 36	6 48	8 00	17 39	.....	19 47	4	2 14.5	12 21	9.6
Sun Apr 03/Mon Apr 04	12 07	18 44	19 57	5 36	6 49	8 03	17 44	.....	20 19	8	3 01.5	17 08	9.7
Mon Apr 04/Tue Apr 05	12 11	18 43	19 56	5 37	6 49	8 05	17 48	.....	20 53	14	3 49.9	21 11	9.7
Tue Apr 05/Wed Apr 06	12 14	18 42	19 54	5 37	6 50	8 08	17 53	.....	21 32	22	4 39.9	24 18	9.7
Wed Apr 06/Thu Apr 07	12 18	18 41	19 53	5 38	6 51	8 11	17 57	.....	22 15	30	5 31.4	26 22	9.7
Thu Apr 07/Fri Apr 08	12 22	18 40	19 52	5 39	6 51	8 14	18 02	.....	23 03	39	6 24.1	27 16	9.8
Fri Apr 08/Sat Apr 09	12 26	18 38	19 51	5 39	6 52	8 17	18 06	.....	23 55	48	7 17.2	26 57	9.8
Sat Apr 09/Sun Apr 10	12 30	18 37	19 50	5 40	6 52	8 19	18 11	.....	0 50	58	8 10.1	25 23	9.8
Sun Apr 10/Mon Apr 11	12 34	18 36	19 49	5 40	6 53	8 22	18 15	.....	1 48	67	9 02.1	22 39	9.9
Mon Apr 11/Tue Apr 12	12 38	18 35	19 48	5 41	6 54	8 25	18 20	.....	2 46	76	9 52.9	18 51	9.9
Tue Apr 12/Wed Apr 13	12 42	18 34	19 47	5 41	6 54	8 28	18 24	.....	3 46	84	10 42.6	14 05	9.9
Wed Apr 13/Thu Apr 14	12 46	18 33	19 46	5 42	6 55	8 31	18 29	16 50	4 46	91	11 31.7	8 33	9.9
Thu Apr 14/Fri Apr 15	12 50	18 32	19 45	5 43	6 55	8 34	18 33	17 21	5 48	96	12 20.9	2 29	10.0
Fri Apr 15/Sat Apr 16	12 54	18 31	19 43	5 43	6 56	8 37	18 38	17 53	6 51	99	13 11.2	- 3 52	10.0
Sat Apr 16/Sun Apr 17	12 58	18 30	19 42	5 44	6 57	8 40	18 42	18 26	.....	100	14 03.5	-10 10	10.0
Sun Apr 17/Mon Apr 18	13 02	18 29	19 41	5 44	6 57	8 43	18 47	19 02	.....	97	14 58.7	-15 59	10.0
Mon Apr 18/Tue Apr 19	13 06	18 27	19 40	5 45	6 58	8 45	18 51	19 43	.....	92	15 57.5	-20 53	10.1
Tue Apr 19/Wed Apr 20	13 10	18 26	19 40	5 45	6 58	8 48	18 56	20 30	.....	85	16 59.7	-24 26	10.1
Wed Apr 20/Thu Apr 21	13 14	18 25	19 39	5 46	6 59	8 51	19 00	21 26	.....	75	18 04.1	-26 19	10.1
Thu Apr 21/Fri Apr 22	13 18	18 24	19 38	5 46	7 00	8 54	19 05	22 28	.....	64	19 08.6	-26 20	10.1
Fri Apr 22/Sat Apr 23	13 21	18 23	19 37	5 47	7 00	8 57	19 09	23 34	.....	53	20 11.1	-24 36	10.2
Sat Apr 23/Sun Apr 24	13 25	18 22	19 36	5 47	7 01	9 00	19 14	0 42	.....	42	21 10.1	-21 23	10.2
Sun Apr 24/Mon Apr 25	13 29	18 21	19 35	5 48	7 02	9 04	19 18	1 48	.....	31	22 05.0	-17 00	10.2
Mon Apr 25/Tue Apr 26	13 33	18 20	19 34	5 49	7 02	9 07	19 23	2 52	.....	22	22 56.1	-11 51	10.2
Tue Apr 26/Wed Apr 27	13 37	18 20	19 33	5 49	7 03	9 10	19 27	3 52	16 18	14	23 44.3	- 6 15	10.3
Wed Apr 27/Thu Apr 28	13 41	18 19	19 32	5 50	7 03	9 13	19 32	4 51	16 48	7	0 30.6	- 0 27	10.3
Thu Apr 28/Fri Apr 29	13 45	18 18	19 32	5 50	7 04	9 16	19 36	5 49	17 18	3	1 16.0	5 16	10.3
Fri Apr 29/Sat Apr 30	13 49	18 17	19 31	5 51	7 05	9 19	19 41	6 46	17 47	0	2 01.5	10 42	10.3
Sat Apr 30/Sun May 01	13 53	18 16	19 30	5 51	7 05	9 22	19 45	7 43	18 18	0	2 47.7	15 40	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.

***** 2022 MAY *****

Date (eve/morn)	LMST midn	----- Sun: -----				LST twilight:		----- Moon: -----				Twilight	
		set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec	hours
Sun May 01/Mon May 02	13 57	18 15	19 29	5 52	7 06	9 25	19 50	.....	18 51	2	3 35.4	19 57	10.4
Mon May 02/Tue May 03	14 01	18 14	19 28	5 52	7 07	9 29	19 54	.....	19 28	5	4 24.7	23 22	10.4
Tue May 03/Wed May 04	14 05	18 13	19 28	5 53	7 07	9 32	19 59	.....	20 10	10	5 15.7	25 46	10.4
Wed May 04/Thu May 05	14 09	18 13	19 27	5 53	7 08	9 35	20 03	.....	20 56	16	6 07.8	27 02	10.4
Thu May 05/Fri May 06	14 13	18 12	19 26	5 54	7 08	9 38	20 07	.....	21 46	23	7 00.5	27 06	10.5
Fri May 06/Sat May 07	14 17	18 11	19 26	5 54	7 09	9 42	20 12	.....	22 40	32	7 52.9	25 57	10.5
Sat May 07/Sun May 08	14 21	18 10	19 25	5 55	7 10	9 45	20 16	.....	23 36	41	8 44.4	23 38	10.5
Sun May 08/Mon May 09	14 25	18 10	19 24	5 55	7 10	9 48	20 21	.....	0 33	51	9 34.5	20 15	10.5
Mon May 09/Tue May 10	14 29	18 09	19 24	5 56	7 11	9 52	20 25	.....	1 31	61	10 23.4	15 56	10.5
Tue May 10/Wed May 11	14 32	18 08	19 23	5 56	7 11	9 55	20 30	.....	2 30	70	11 11.5	10 48	10.6
Wed May 11/Thu May 12	14 36	18 07	19 23	5 57	7 12	9 58	20 34	.....	3 30	80	11 59.5	5 02	10.6
Thu May 12/Fri May 13	14 40	18 07	19 22	5 57	7 13	10 02	20 39	.....	4 31	88	12 48.4	- 1 10	10.6
Fri May 13/Sat May 14	14 44	18 06	19 22	5 58	7 13	10 05	20 43	16 21	5 35	94	13 39.3	- 7 30	10.6
Sat May 14/Sun May 15	14 48	18 06	19 21	5 58	7 14	10 08	20 48	16 55	6 44	99	14 33.4	-13 38	10.6
Sun May 15/Mon May 16	14 52	18 05	19 21	5 59	7 15	10 12	20 52	17 34	7 55	100	15 31.6	-19 06	10.6
Mon May 16/Tue May 17	14 56	18 04	19 20	5 59	7 15	10 15	20 57	18 20	.....	98	16 34.2	-23 23	10.7
Tue May 17/Wed May 18	15 00	18 04	19 20	6 00	7 16	10 19	21 01	19 13	.....	94	17 40.3	-26 02	10.7
Wed May 18/Thu May 19	15 04	18 03	19 19	6 00	7 16	10 22	21 05	20 15	.....	87	18 47.7	-26 43	10.7
Thu May 19/Fri May 20	15 08	18 03	19 19	6 01	7 17	10 26	21 10	21 22	.....	78	19 53.5	-25 28	10.7
Fri May 20/Sat May 21	15 12	18 02	19 18	6 01	7 18	10 30	21 14	22 32	.....	67	20 55.6	-22 30	10.7
Sat May 21/Sun May 22	15 16	18 02	19 18	6 02	7 18	10 33	21 19	23 40	.....	56	21 52.9	-18 16	10.7
Sun May 22/Mon May 23	15 20	18 02	19 18	6 02	7 19	10 37	21 23	0 45	.....	45	22 45.7	-13 10	10.7
Mon May 23/Tue May 24	15 24	18 01	19 17	6 03	7 19	10 40	21 28	1 47	.....	34	23 34.8	- 7 35	10.8
Tue May 24/Wed May 25	15 28	18 01	19 17	6 03	7 20	10 44	21 32	2 46	.....	25	0 21.3	- 1 49	10.8
Wed May 25/Thu May 26	15 32	18 00	19 17	6 04	7 20	10 48	21 36	3 43	.....	17	1 06.5	3 55	10.8
Thu May 26/Fri May 27	15 36	18 00	19 17	6 04	7 21	10 51	21 41	4 40	15 50	10	1 51.5	9 23	10.8
Fri May 27/Sat May 28	15 39	18 00	19 16	6 05	7 22	10 55	21 45	5 36	16 20	5	2 37.0	14 25	10.8
Sat May 28/Sun May 29	15 43	17 59	19 16	6 05	7 22	10 59	21 50	6 33	16 52	2	3 23.8	18 50	10.8
Sun May 29/Mon May 30	15 47	17 59	19 16	6 06	7 23	11 03	21 54	7 30	17 27	0	4 12.3	22 27	10.8
Mon May 30/Tue May 31	15 51	17 59	19 16	6 06	7 23	11 06	21 58	.....	18 07	0	5 02.6	25 07	10.8
Tue May 31/Wed Jun 01	15 55	17 59	19 16	6 07	7 24	11 10	22 03	.....	18 51	3	5 54.3	26 40	10.8

***** 2022 JUNE *****

Date (eve/morn)	LMST midn	----- Sun: -----				LST twilight:		----- Moon: -----				Twilight	
		set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec	hours
Wed Jun 01/Thu Jun 02	15 59	17 58	19 16	6 07	7 24	11 14	22 07	.....	19 40	6	6 46.7	27 03	10.9
Thu Jun 02/Fri Jun 03	16 03	17 58	19 15	6 07	7 25	11 18	22 12	.....	20 33	12	7 38.9	26 13	10.9
Fri Jun 03/Sat Jun 04	16 07	17 58	19 15	6 08	7 25	11 22	22 16	.....	21 28	18	8 30.1	24 13	10.9
Sat Jun 04/Sun Jun 05	16 11	17 58	19 15	6 08	7 26	11 26	22 20	.....	22 25	26	9 19.8	21 11	10.9
Sun Jun 05/Mon Jun 06	16 15	17 58	19 15	6 09	7 26	11 29	22 25	.....	23 22	35	10 08.0	17 12	10.9
Mon Jun 06/Tue Jun 07	16 19	17 58	19 15	6 09	7 27	11 33	22 29	.....	0 18	45	10 55.0	12 26	10.9
Tue Jun 07/Wed Jun 08	16 23	17 58	19 15	6 09	7 27	11 37	22 33	.....	1 16	55	11 41.5	7 02	10.9
Wed Jun 08/Thu Jun 09	16 27	17 58	19 15	6 10	7 27	11 41	22 38	.....	2 15	65	12 28.5	1 10	10.9
Thu Jun 09/Fri Jun 10	16 31	17 58	19 15	6 10	7 28	11 45	22 42	.....	3 16	75	13 17.0	- 4 57	10.9
Fri Jun 10/Sat Jun 11	16 35	17 58	19 15	6 11	7 28	11 49	22 46	.....	4 21	84	14 08.3	-11 04	10.9
Sat Jun 11/Sun Jun 12	16 39	17 58	19 15	6 11	7 29	11 53	22 51	.....	5 30	92	15 03.7	-16 48	10.9
Sun Jun 12/Mon Jun 13	16 43	17 58	19 15	6 11	7 29	11 57	22 55	16 07	6 42	97	16 04.1	-21 40	10.9
Mon Jun 13/Tue Jun 14	16 47	17 58	19 15	6 12	7 29	12 01	22 59	16 56	7 56	100	17 09.3	-25 09	10.9
Tue Jun 14/Wed Jun 15	16 50	17 58	19 16	6 12	7 30	12 05	23 03	17 55	.....	99	18 17.9	-26 45	10.9
Wed Jun 15/Thu Jun 16	16 54	17 58	19 16	6 12	7 30	12 09	23 08	19 02	.....	95	19 26.9	-26 16	10.9
Thu Jun 16/Fri Jun 17	16 58	17 58	19 16	6 12	7 30	12 13	23 12	20 14	.....	89	20 33.1	-23 49	10.9
Fri Jun 17/Sat Jun 18	17 02	17 58	19 16	6 13	7 31	12 18	23 16	21 26	.....	80	21 34.5	-19 48	10.9
Sat Jun 18/Sun Jun 19	17 06	17 58	19 16	6 13	7 31	12 22	23 20	22 34	.....	70	22 30.6	-14 44	10.9
Sun Jun 19/Mon Jun 20	17 10	17 58	19 16	6 13	7 31	12 26	23 24	23 39	.....	60	23 22.3	- 9 04	10.9
Mon Jun 20/Tue Jun 21	17 14	17 59	19 17	6 13	7 31	12 30	23 29	0 40	.....	49	0 10.5	- 3 10	10.9
Tue Jun 21/Wed Jun 22	17 18	17 59	19 17	6 14	7 32	12 34	23 33	1 38	.....	38	0 56.7	2 40	10.9
Wed Jun 22/Thu Jun 23	17 22	17 59	19 17	6 14	7 32	12 38	23 37	2 35	.....	29	1 42.0	8 15	10.9
Thu Jun 23/Fri Jun 24	17 26	17 59	19 17	6 14	7 32	12 42	23 41	3 31	.....	20	2 27.4	13 24	10.9
Fri Jun 24/Sat Jun 25	17 30	18 00	19 18	6 14	7 32	12 47	23 45	4 28	.....	13	3 13.8	17 56	10.9
Sat Jun 25/Sun Jun 26	17 34	18 00	19 18	6 14	7 32	12 51	23 49	5 25	.....	8	4 01.8	21 42	10.9
Sun Jun 26/Mon Jun 27	17 38	18 00	19 18	6 14	7 32	12 55	23 53	6 21	16 06	3	4 51.5	24 33	10.9
Mon Jun 27/Tue Jun 28	17 42	18 01	19 18	6 15	7 32	12 59	23 57	7 16	16 49	1	5 42.7	26 20	10.9
Tue Jun 28/Wed Jun 29	17 46	18 01	19 19	6 15	7 32	13 04	0 01	8 07	17 36	0	6 34.8	26 57	10.9
Wed Jun 29/Thu Jun 30	17 50	18 01	19 19	6 15	7 32	13 08	0 05	.....	18 28	1	7 27.0	26 22	10.9
Thu Jun 30/Fri Jul 01	17 54	18 02	19 19	6 15	7 32	13 12	0 09	.....	19 23	4	8 18.3	24 37	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.

***** 2022 JULY *****

Date (eve/morn)		LMST midn	----- Sun: -----				LST twilight:		----- Moon: -----				Twi-Twi	
			set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec	hours
Fri Jul 01/Sat Jul 02		17 57	18 02	19 20	6 15	7 32	13 16	0 13	.....	20 19	8	9 08.1	21 48	10.9
Sat Jul 02/Sun Jul 03		18 01	18 02	19 20	6 15	7 32	13 21	0 17	.....	21 16	14	9 56.2	18 03	10.9
Sun Jul 03/Mon Jul 04		18 05	18 03	19 20	6 15	7 32	13 25	0 21	.....	22 12	21	10 42.7	13 31	10.9
Mon Jul 04/Tue Jul 05		18 09	18 03	19 21	6 15	7 32	13 29	0 25	.....	23 08	30	11 28.3	8 23	10.9
Tue Jul 05/Wed Jul 06		18 13	18 04	19 21	6 15	7 32	13 34	0 29	.....	0 05	40	12 13.7	2 47	10.9
Wed Jul 06/Thu Jul 07		18 17	18 04	19 22	6 15	7 32	13 38	0 33	.....	1 03	50	13 00.1	- 3 06	10.9
Thu Jul 07/Fri Jul 08		18 21	18 05	19 22	6 15	7 32	13 42	0 37	.....	2 04	61	13 48.5	- 9 02	10.9
Fri Jul 08/Sat Jul 09		18 25	18 05	19 22	6 15	7 32	13 47	0 41	.....	3 09	71	14 40.4	-14 44	10.9
Sat Jul 09/Sun Jul 10		18 29	18 05	19 23	6 14	7 32	13 51	0 44	.....	4 18	81	15 36.8	-19 50	10.9
Sun Jul 10/Mon Jul 11		18 33	18 06	19 23	6 14	7 31	13 55	0 48	.....	5 30	90	16 38.5	-23 52	10.9
Mon Jul 11/Tue Jul 12		18 37	18 06	19 24	6 14	7 31	14 00	0 52	.....	6 42	96	17 45.0	-26 19	10.8
Tue Jul 12/Wed Jul 13		18 41	18 07	19 24	6 14	7 31	14 04	0 56	16 37	7 49	99	18 54.2	-26 47	10.8
Wed Jul 13/Thu Jul 14		18 45	18 07	19 24	6 14	7 31	14 08	1 00	17 48	.....	100	20 02.9	-25 09	10.8
Thu Jul 14/Fri Jul 15		18 49	18 08	19 25	6 14	7 30	14 13	1 03	19 02	.....	97	21 08.0	-21 39	10.8
Fri Jul 15/Sat Jul 16		18 53	18 08	19 25	6 13	7 30	14 17	1 07	20 15	.....	91	22 08.2	-16 47	10.8
Sat Jul 16/Sun Jul 17		18 57	18 09	19 26	6 13	7 30	14 22	1 11	21 23	.....	83	23 03.5	-11 04	10.8
Sun Jul 17/Mon Jul 18		19 01	18 10	19 26	6 13	7 29	14 26	1 14	22 28	.....	74	23 54.6	- 4 58	10.8
Mon Jul 18/Tue Jul 19		19 04	18 10	19 27	6 12	7 29	14 30	1 18	23 29	.....	64	0 42.9	1 08	10.8
Tue Jul 19/Wed Jul 20		19 08	18 11	19 27	6 12	7 28	14 35	1 22	0 28	.....	54	1 29.6	6 59	10.8
Wed Jul 20/Thu Jul 21		19 12	18 11	19 27	6 12	7 28	14 39	1 25	1 25	.....	43	2 15.9	12 22	10.7
Thu Jul 21/Fri Jul 22		19 16	18 12	19 28	6 11	7 27	14 44	1 29	2 22	.....	34	3 02.8	17 07	10.7
Fri Jul 22/Sat Jul 23		19 20	18 12	19 28	6 11	7 27	14 48	1 32	3 19	.....	25	3 50.8	21 05	10.7
Sat Jul 23/Sun Jul 24		19 24	18 13	19 29	6 11	7 26	14 52	1 36	4 16	.....	17	4 40.3	24 08	10.7
Sun Jul 24/Mon Jul 25		19 28	18 13	19 29	6 10	7 26	14 57	1 39	5 11	.....	11	5 31.3	26 08	10.7
Mon Jul 25/Tue Jul 26		19 32	18 14	19 30	6 10	7 25	15 01	1 43	6 04	.....	6	6 23.3	26 58	10.7
Tue Jul 26/Wed Jul 27		19 36	18 15	19 30	6 09	7 25	15 06	1 46	6 52	16 23	2	7 15.6	26 37	10.6
Wed Jul 27/Thu Jul 28		19 40	18 15	19 31	6 09	7 24	15 10	1 50	7 36	17 17	0	8 07.2	25 05	10.6
Thu Jul 28/Fri Jul 29		19 44	18 16	19 31	6 08	7 24	15 14	1 53	.....	18 14	0	8 57.4	22 27	10.6
Fri Jul 29/Sat Jul 30		19 48	18 16	19 32	6 08	7 23	15 19	1 56	.....	19 10	2	9 45.8	18 50	10.6
Sat Jul 30/Sun Jul 31		19 52	18 17	19 32	6 07	7 22	15 23	2 00	.....	20 07	5	10 32.6	14 26	10.6
Sun Jul 31/Mon Aug 01		19 56	18 17	19 33	6 06	7 21	15 28	2 03	.....	21 04	11	11 18.1	9 24	10.6

***** 2022 AUGUST *****

Date (eve/morn)		LMST midn	----- Sun: -----				LST twilight:		----- Moon: -----				Twi-Twi	
			set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec	hours
Mon Aug 01/Tue Aug 02		20 00	18 18	19 33	6 06	7 21	15 32	2 07	.....	22 00	17	12 03.0	3 55	10.5
Tue Aug 02/Wed Aug 03		20 04	18 19	19 34	6 05	7 20	15 36	2 10	.....	22 57	26	12 48.3	- 1 50	10.5
Wed Aug 03/Thu Aug 04		20 08	18 19	19 34	6 05	7 19	15 41	2 13	.....	23 56	35	13 35.0	- 7 39	10.5
Thu Aug 04/Fri Aug 05		20 12	18 20	19 34	6 04	7 19	15 45	2 16	.....	0 58	46	14 24.2	-13 16	10.5
Fri Aug 05/Sat Aug 06		20 15	18 20	19 35	6 03	7 18	15 50	2 20	.....	2 03	57	15 17.2	-18 25	10.5
Sat Aug 06/Sun Aug 07		20 19	18 21	19 35	6 02	7 17	15 54	2 23	.....	3 12	68	16 14.9	-22 41	10.5
Sun Aug 07/Mon Aug 08		20 23	18 21	19 36	6 02	7 16	15 59	2 26	.....	4 22	79	17 17.5	-25 40	10.4
Mon Aug 08/Tue Aug 09		20 27	18 22	19 36	6 01	7 15	16 03	2 29	.....	5 29	88	18 23.9	-26 54	10.4
Tue Aug 09/Wed Aug 10		20 31	18 23	19 37	6 00	7 14	16 07	2 32	.....	6 30	94	19 31.7	-26 09	10.4
Wed Aug 10/Thu Aug 11		20 35	18 23	19 37	5 59	7 13	16 12	2 36	16 36	7 23	99	20 38.1	-23 26	10.4
Thu Aug 11/Fri Aug 12		20 39	18 24	19 38	5 59	7 13	16 16	2 39	17 49	.....	100	21 40.7	-19 04	10.3
Fri Aug 12/Sat Aug 13		20 43	18 24	19 38	5 58	7 12	16 21	2 42	19 01	.....	98	22 38.9	-13 32	10.3
Sat Aug 13/Sun Aug 14		20 47	18 25	19 39	5 57	7 11	16 25	2 45	20 09	.....	93	23 32.9	- 7 22	10.3
Sun Aug 14/Mon Aug 15		20 51	18 25	19 39	5 56	7 10	16 29	2 48	21 13	.....	87	0 23.6	- 1 00	10.3
Mon Aug 15/Tue Aug 16		20 55	18 26	19 40	5 55	7 09	16 34	2 51	22 15	.....	78	1 12.4	5 12	10.3
Tue Aug 16/Wed Aug 17		20 59	18 27	19 40	5 54	7 08	16 38	2 54	23 14	.....	69	2 00.2	10 57	10.2
Wed Aug 17/Thu Aug 18		21 03	18 27	19 41	5 53	7 07	16 43	2 57	0 13	.....	59	2 48.2	16 04	10.2
Thu Aug 18/Fri Aug 19		21 07	18 28	19 41	5 52	7 06	16 47	3 00	1 11	.....	49	3 36.9	20 22	10.2
Fri Aug 19/Sat Aug 20		21 11	18 28	19 42	5 52	7 05	16 52	3 03	2 09	.....	40	4 26.9	23 44	10.2
Sat Aug 20/Sun Aug 21		21 15	18 29	19 42	5 51	7 04	16 56	3 06	3 05	.....	31	5 18.1	26 01	10.1
Sun Aug 21/Mon Aug 22		21 19	18 29	19 43	5 50	7 03	17 00	3 09	3 59	.....	23	6 10.3	27 08	10.1
Mon Aug 22/Tue Aug 23		21 22	18 30	19 43	5 49	7 02	17 05	3 12	4 49	.....	15	7 02.8	27 02	10.1
Tue Aug 23/Wed Aug 24		21 26	18 30	19 44	5 48	7 01	17 09	3 15	5 34	.....	9	7 54.8	25 44	10.1
Wed Aug 24/Thu Aug 25		21 30	18 31	19 44	5 47	6 59	17 14	3 18	6 15	.....	5	8 45.5	23 18	10.0
Thu Aug 25/Fri Aug 26		21 34	18 32	19 45	5 45	6 58	17 18	3 21	6 51	17 03	2	9 34.6	19 51	10.0
Fri Aug 26/Sat Aug 27		21 38	18 32	19 45	5 44	6 57	17 23	3 24	7 24	18 01	0	10 21.9	15 33	10.0
Sat Aug 27/Sun Aug 28		21 42	18 33	19 45	5 43	6 56	17 27	3 26	.....	18 58	1	11 07.9	10 34	10.0
Sun Aug 28/Mon Aug 29		21 46	18 33	19 46	5 42	6 55	17 31	3 29	.....	19 55	3	11 53.2	5 06	9.9
Mon Aug 29/Tue Aug 30		21 50	18 34	19 46	5 41	6 54	17 36	3 32	.....	20 52	8	12 38.4	- 0 40	9.9
Tue Aug 30/Wed Aug 31		21 54	18 34	19 47	5 40	6 53	17 40	3 35	.....	21 51	14	13 24.6	- 6 30	9.9
Wed Aug 31/Thu Sep 01		21 58	18 35	19 47	5 39	6 52	17 45	3 38	.....	22 52	22	14 12.8	-12 10	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.

***** 2022 SEPTEMBER *****

Date (eve/morn)	LMST midn	----- Sun: -----				LST twilight:		----- Moon: -----				Twilight		
		set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec	hours	
Thu Sep 01/Fri Sep 02	22 02	18 35	19 48	5 38	6 50	17 49	3 41	.....	23 55	32	15 04.0	-17 23	9.8
Fri Sep 02/Sat Sep 03	22 06	18 36	19 48	5 37	6 49	17 54	3 43	.....	1 02	43	15 59.2	-21 49	9.8
Sat Sep 03/Sun Sep 04	22 10	18 36	19 49	5 35	6 48	17 58	3 46	.....	2 10	54	16 58.6	-25 04	9.8
Sun Sep 04/Mon Sep 05	22 14	18 37	19 49	5 34	6 47	18 03	3 49	.....	3 16	65	18 01.8	-26 48	9.7
Mon Sep 05/Tue Sep 06	22 18	18 37	19 50	5 33	6 46	18 07	3 52	.....	4 18	76	19 07.1	-26 43	9.7
Tue Sep 06/Wed Sep 07	22 22	18 38	19 51	5 32	6 44	18 11	3 54	.....	5 13	85	20 12.1	-24 44	9.7
Wed Sep 07/Thu Sep 08	22 26	18 38	19 51	5 31	6 43	18 16	3 57	.....	6 00	93	21 14.7	-21 02	9.7
Thu Sep 08/Fri Sep 09	22 30	18 39	19 52	5 29	6 42	18 20	4 00	16 38	6 40	98	22 13.6	-15 58	9.6
Fri Sep 09/Sat Sep 10	22 33	18 40	19 52	5 28	6 41	18 25	4 03	17 48	7 16	100	23 08.9	-10 00	9.6
Sat Sep 10/Sun Sep 11	22 37	18 40	19 53	5 27	6 39	18 29	4 05	.....	18 54	99	0 01.1	- 3 36	9.6
Sun Sep 11/Mon Sep 12	22 41	18 41	19 53	5 26	6 38	18 34	4 08	.....	19 57	96	0 51.3	2 51	9.5
Mon Sep 12/Tue Sep 13	22 45	18 41	19 54	5 25	6 37	18 38	4 11	.....	20 59	90	1 40.4	8 59	9.5
Tue Sep 13/Wed Sep 14	22 49	18 42	19 54	5 23	6 36	18 43	4 13	.....	21 59	83	2 29.4	14 33	9.5
Wed Sep 14/Thu Sep 15	22 53	18 42	19 55	5 22	6 35	18 47	4 16	.....	22 59	75	3 19.1	19 18	9.5
Thu Sep 15/Fri Sep 16	22 57	18 43	19 55	5 21	6 33	18 52	4 19	.....	23 58	66	4 09.9	23 06	9.4
Fri Sep 16/Sat Sep 17	23 01	18 43	19 56	5 19	6 32	18 56	4 21	.....	0 56	56	5 01.8	25 47	9.4
Sat Sep 17/Sun Sep 18	23 05	18 44	19 57	5 18	6 31	19 01	4 24	.....	1 51	47	5 54.6	27 17	9.4
Sun Sep 18/Mon Sep 19	23 09	18 44	19 57	5 17	6 29	19 05	4 27	.....	2 43	38	6 47.7	27 32	9.3
Mon Sep 19/Tue Sep 20	23 13	18 45	19 58	5 16	6 28	19 10	4 29	.....	3 30	29	7 40.2	26 33	9.3
Tue Sep 20/Wed Sep 21	23 17	18 45	19 58	5 14	6 27	19 14	4 32	.....	4 12	21	8 31.4	24 24	9.3
Wed Sep 21/Thu Sep 22	23 21	18 46	19 59	5 13	6 26	19 19	4 35	.....	4 50	14	9 21.0	21 11	9.2
Thu Sep 22/Fri Sep 23	23 25	18 47	20 00	5 12	6 24	19 24	4 37	.....	5 24	8	10 09.0	17 04	9.2
Fri Sep 23/Sat Sep 24	23 29	18 47	20 00	5 10	6 23	19 28	4 40	5 55	16 48	3	10 55.5	12 11	9.2
Sat Sep 24/Sun Sep 25	23 33	18 48	20 01	5 09	6 22	19 33	4 42	6 25	17 46	1	11 41.2	6 45	9.1
Sun Sep 25/Mon Sep 26	23 37	18 48	20 01	5 08	6 21	19 37	4 45	6 54	18 44	0	12 26.8	0 56	9.1
Mon Sep 26/Tue Sep 27	23 40	18 49	20 02	5 06	6 19	19 42	4 48	.....	19 43	2	13 13.2	- 5 01	9.1
Tue Sep 27/Wed Sep 28	23 44	18 49	20 03	5 05	6 18	19 46	4 50	.....	20 44	5	14 01.4	-10 51	9.0
Wed Sep 28/Thu Sep 29	23 48	18 50	20 03	5 04	6 17	19 51	4 53	.....	21 48	11	14 52.3	-16 17	9.0
Thu Sep 29/Fri Sep 30	23 52	18 51	20 04	5 02	6 16	19 56	4 55	.....	22 55	19	15 46.7	-20 57	9.0
Fri Sep 30/Sat Oct 01	23 56	18 51	20 05	5 01	6 14	20 00	4 58	.....	0 03	29	16 45.0	-24 30	8.9

***** 2022 OCTOBER *****

Date (eve/morn)	LMST midn	----- Sun: -----				LST twilight:		----- Moon: -----				Twilight		
		set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec	hours	
Sat Oct 01/Sun Oct 02	0 00	18 52	20 05	5 00	6 13	20 05	5 01	.....	1 10	40	17 46.7	-26 35	8.9
Sun Oct 02/Mon Oct 03	0 04	18 52	20 06	4 58	6 12	20 10	5 03	.....	2 12	51	18 50.2	-26 56	8.9
Mon Oct 03/Tue Oct 04	0 08	18 53	20 07	4 57	6 11	20 14	5 06	.....	3 08	63	19 53.7	-25 29	8.8
Tue Oct 04/Wed Oct 05	0 12	18 53	20 08	4 56	6 10	20 19	5 08	.....	3 56	73	20 55.1	-22 21	8.8
Wed Oct 05/Thu Oct 06	0 16	18 54	20 08	4 54	6 08	20 24	5 11	.....	4 37	83	21 53.4	-17 48	8.8
Thu Oct 06/Fri Oct 07	0 20	18 55	20 09	4 53	6 07	20 28	5 14	.....	5 13	91	22 48.3	-12 14	8.7
Fri Oct 07/Sat Oct 08	0 24	18 55	20 10	4 52	6 06	20 33	5 16	.....	5 46	96	23 40.3	- 6 03	8.7
Sat Oct 08/Sun Oct 09*	0 28	18 56	20 11	5 50	7 05	20 38	5 19	.....	17 40	99	0 30.4	0 23	8.7
Sun Oct 09/Mon Oct 10	23 32	19 57	21 11	5 49	7 04	20 42	5 21	.....	19 42	100	1 18.4	6 26	8.6
Mon Oct 10/Tue Oct 11	23 36	19 57	21 12	5 48	7 02	20 47	5 24	.....	20 43	98	2 07.5	12 20	8.6
Tue Oct 11/Wed Oct 12	23 39	19 58	21 13	5 46	7 01	20 52	5 27	.....	21 44	94	2 57.4	17 33	8.6
Wed Oct 12/Thu Oct 13	23 43	19 59	21 14	5 45	7 00	20 57	5 29	.....	22 44	88	3 48.4	21 51	8.5
Thu Oct 13/Fri Oct 14	23 47	19 59	21 15	5 44	6 59	21 02	5 32	.....	23 44	81	4 40.7	25 04	8.5
Fri Oct 14/Sat Oct 15	23 51	20 00	21 15	5 42	6 58	21 06	5 35	.....	0 41	73	5 34.1	27 05	8.4
Sat Oct 15/Sun Oct 16	23 55	20 01	21 16	5 41	6 57	21 11	5 37	.....	1 35	64	6 27.7	27 49	8.4
Sun Oct 16/Mon Oct 17	23 59	20 01	21 17	5 40	6 56	21 16	5 40	.....	2 24	55	7 20.9	27 16	8.4
Mon Oct 17/Tue Oct 18	0 03	20 02	21 18	5 39	6 55	21 21	5 43	.....	3 08	46	8 12.7	25 32	8.3
Tue Oct 18/Wed Oct 19	0 07	20 03	21 19	5 37	6 54	21 26	5 45	.....	3 47	36	9 02.8	22 42	8.3
Wed Oct 19/Thu Oct 20	0 11	20 03	21 20	5 36	6 52	21 30	5 48	.....	4 22	28	9 51.1	18 55	8.3
Thu Oct 20/Fri Oct 21	0 15	20 04	21 21	5 35	6 51	21 35	5 51	.....	4 54	19	10 37.8	14 19	8.2
Fri Oct 21/Sat Oct 22	0 19	20 05	21 22	5 33	6 50	21 40	5 53	.....	5 24	12	11 23.5	9 04	8.2
Sat Oct 22/Sun Oct 23	0 23	20 05	21 23	5 32	6 49	21 45	5 56	5 53	17 31	6	12 09.1	3 21	8.2
Sun Oct 23/Mon Oct 24	0 27	20 06	21 24	5 31	6 48	21 50	5 59	6 23	18 29	2	12 55.4	- 2 39	8.1
Mon Oct 24/Tue Oct 25	0 31	20 07	21 25	5 30	6 47	21 55	6 01	.....	19 31	0	13 43.4	- 8 40	8.1
Tue Oct 25/Wed Oct 26	0 35	20 08	21 26	5 29	6 46	22 00	6 04	.....	20 35	0	14 34.1	-14 24	8.1
Wed Oct 26/Thu Oct 27	0 39	20 08	21 26	5 27	6 45	22 05	6 07	.....	21 42	3	15 28.5	-19 29	8.0
Thu Oct 27/Fri Oct 28	0 43	20 09	21 27	5 26	6 45	22 10	6 10	.....	22 52	9	16 26.8	-23 32	8.0
Fri Oct 28/Sat Oct 29	0 46	20 10	21 28	5 25	6 44	22 15	6 13	.....	0 01	16	17 28.8	-26 09	7.9
Sat Oct 29/Sun Oct 30	0 50	20 11	21 29	5 24	6 43	22 20	6 15	.....	1 07	26	18 32.8	-27 02	7.9
Sun Oct 30/Mon Oct 31	0 54	20 12	21 31	5 23	6 42	22 24	6 18	.....	2 05	36	19 36.8	-26 04	7.9
Mon Oct 31/Tue Nov 01	0 58	20 12	21 32	5 22	6 41	22 29	6 21	.....	2 55	48	20 38.7	-23 22	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.

***** 2022 NOVEMBER *****

Date (eve/morn)	LMST midn	----- Sun: -----				LST twilight:		----- Moon: -----				Twilight	
		set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec	hours
Tue Nov 01/Wed Nov 02	1 02	20 13	21 33	5 21	6 40	22 34	6 24	.....	3 38	59	21 37.0	-19 14	7.8
Wed Nov 02/Thu Nov 03	1 06	20 14	21 34	5 20	6 39	22 39	6 27	.....	4 14	70	22 31.7	-14 01	7.8
Thu Nov 03/Fri Nov 04	1 10	20 15	21 35	5 19	6 39	22 44	6 30	.....	4 47	80	23 23.3	- 8 07	7.7
Fri Nov 04/Sat Nov 05	1 14	20 16	21 36	5 18	6 38	22 49	6 32	.....	5 18	88	0 12.7	- 1 52	7.7
Sat Nov 05/Sun Nov 06	1 18	20 16	21 37	5 17	6 37	22 54	6 35	17 30	5 48	94	1 01.0	4 24	7.7
Sun Nov 06/Mon Nov 07	1 22	20 17	21 38	5 16	6 36	23 00	6 38	18 30	6 19	98	1 49.3	10 24	7.6
Mon Nov 07/Tue Nov 08	1 26	20 18	21 39	5 15	6 36	23 05	6 41	19 30	.....	100	2 38.4	15 52	7.6
Tue Nov 08/Wed Nov 09	1 30	20 19	21 40	5 14	6 35	23 10	6 44	20 30	.....	99	3 29.0	20 33	7.6
Wed Nov 09/Thu Nov 10	1 34	20 20	21 41	5 13	6 34	23 15	6 47	21 30	.....	97	4 21.2	24 13	7.5
Thu Nov 10/Fri Nov 11	1 38	20 21	21 42	5 12	6 34	23 20	6 50	22 29	.....	93	5 14.9	26 42	7.5
Fri Nov 11/Sat Nov 12	1 42	20 21	21 43	5 11	6 33	23 25	6 53	23 25	.....	87	6 09.2	27 54	7.5
Sat Nov 12/Sun Nov 13	1 46	20 22	21 45	5 10	6 32	23 30	6 57	0 17	.....	80	7 03.2	27 47	7.4
Sun Nov 13/Mon Nov 14	1 50	20 23	21 46	5 09	6 32	23 35	7 00	1 03	.....	72	7 56.0	26 25	7.4
Mon Nov 14/Tue Nov 15	1 53	20 24	21 47	5 08	6 31	23 40	7 03	1 44	.....	63	8 46.8	23 55	7.4
Tue Nov 15/Wed Nov 16	1 57	20 25	21 48	5 08	6 31	23 45	7 06	2 20	.....	54	9 35.4	20 26	7.3
Wed Nov 16/Thu Nov 17	2 01	20 26	21 49	5 07	6 30	23 50	7 09	2 53	.....	44	10 22.2	16 08	7.3
Thu Nov 17/Fri Nov 18	2 05	20 27	21 50	5 06	6 30	23 55	7 12	3 23	.....	35	11 07.6	11 09	7.3
Fri Nov 18/Sat Nov 19	2 09	20 28	21 51	5 05	6 29	0 00	7 16	3 52	.....	26	11 52.5	5 39	7.2
Sat Nov 19/Sun Nov 20	2 13	20 28	21 52	5 05	6 29	0 05	7 19	4 21	.....	17	12 37.9	- 0 11	7.2
Sun Nov 20/Mon Nov 21	2 17	20 29	21 54	5 04	6 29	0 10	7 22	4 51	.....	10	13 24.7	- 6 11	7.2
Mon Nov 21/Tue Nov 22	2 21	20 30	21 55	5 04	6 28	0 15	7 26	5 24	18 15	4	14 14.3	-12 03	7.1
Tue Nov 22/Wed Nov 23	2 25	20 31	21 56	5 03	6 28	0 21	7 29	6 02	19 21	1	15 07.6	-17 29	7.1
Wed Nov 23/Thu Nov 24	2 29	20 32	21 57	5 02	6 28	0 26	7 32	.....	20 31	0	16 05.3	-22 02	7.1
Thu Nov 24/Fri Nov 25	2 33	20 33	21 58	5 02	6 27	0 31	7 36	.....	21 43	2	17 07.4	-25 15	7.1
Fri Nov 25/Sat Nov 26	2 37	20 34	21 59	5 01	6 27	0 36	7 39	.....	22 53	6	18 12.6	-26 45	7.0
Sat Nov 26/Sun Nov 27	2 41	20 34	22 00	5 01	6 27	0 41	7 43	.....	23 57	13	19 18.5	-26 19	7.0
Sun Nov 27/Mon Nov 28	2 45	20 35	22 01	5 01	6 27	0 46	7 46	.....	0 52	22	20 22.5	-24 01	7.0
Mon Nov 28/Tue Nov 29	2 49	20 36	22 02	5 00	6 27	0 51	7 50	.....	1 38	33	21 22.7	-20 09	7.0
Tue Nov 29/Wed Nov 30	2 53	20 37	22 03	5 00	6 26	0 56	7 53	.....	2 16	44	22 18.6	-15 09	6.9
Wed Nov 30/Thu Dec 01	2 57	20 38	22 04	5 00	6 26	1 01	7 57	.....	2 50	55	23 10.7	- 9 24	6.9

***** 2022 DECEMBER *****

Date (eve/morn)	LMST midn	----- Sun: -----				LST twilight:		----- Moon: -----				Twilight	
		set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec	hours
Thu Dec 01/Fri Dec 02	3 01	20 39	22 05	4 59	6 26	1 06	8 01	.....	3 21	66	0 00.0	- 3 17	6.9
Fri Dec 02/Sat Dec 03	3 04	20 39	22 06	4 59	6 26	1 11	8 04	.....	3 51	76	0 47.8	2 55	6.9
Sat Dec 03/Sun Dec 04	3 08	20 40	22 07	4 59	6 26	1 16	8 08	.....	4 20	84	1 35.1	8 54	6.9
Sun Dec 04/Mon Dec 05	3 12	20 41	22 08	4 59	6 26	1 21	8 12	.....	4 52	91	2 23.1	14 26	6.8
Mon Dec 05/Tue Dec 06	3 16	20 42	22 09	4 59	6 26	1 25	8 16	18 21	5 26	96	3 12.5	19 18	6.8
Tue Dec 06/Wed Dec 07	3 20	20 43	22 10	4 59	6 26	1 30	8 20	19 20	6 04	99	4 03.8	23 16	6.8
Wed Dec 07/Thu Dec 08	3 24	20 43	22 11	4 59	6 27	1 35	8 24	20 19	.....	100	4 56.9	26 08	6.8
Thu Dec 08/Fri Dec 09	3 28	20 44	22 12	4 59	6 27	1 40	8 28	21 16	.....	99	5 51.2	27 45	6.8
Fri Dec 09/Sat Dec 10	3 32	20 45	22 13	4 59	6 27	1 45	8 32	22 10	.....	96	6 45.8	28 03	6.8
Sat Dec 10/Sun Dec 11	3 36	20 46	22 14	4 59	6 27	1 50	8 36	22 58	.....	92	7 39.5	27 03	6.7
Sun Dec 11/Mon Dec 12	3 40	20 46	22 15	4 59	6 27	1 54	8 40	23 41	.....	86	8 31.2	24 51	6.7
Mon Dec 12/Tue Dec 13	3 44	20 47	22 15	4 59	6 28	1 59	8 44	0 19	.....	79	9 20.7	21 38	6.7
Tue Dec 13/Wed Dec 14	3 48	20 48	22 16	4 59	6 28	2 04	8 48	0 52	.....	71	10 07.8	17 34	6.7
Wed Dec 14/Thu Dec 15	3 52	20 48	22 17	4 59	6 28	2 08	8 52	1 22	.....	62	10 53.1	12 49	6.7
Thu Dec 15/Fri Dec 16	3 56	20 49	22 18	5 00	6 29	2 13	8 56	1 51	.....	52	11 37.4	7 33	6.7
Fri Dec 16/Sat Dec 17	4 00	20 49	22 18	5 00	6 29	2 18	9 00	2 19	.....	42	12 21.6	1 56	6.7
Sat Dec 17/Sun Dec 18	4 04	20 50	22 19	5 00	6 29	2 22	9 05	2 47	.....	32	13 06.7	- 3 54	6.7
Sun Dec 18/Mon Dec 19	4 08	20 51	22 20	5 01	6 30	2 27	9 09	3 18	.....	23	13 54.1	- 9 42	6.7
Mon Dec 19/Tue Dec 20	4 11	20 51	22 20	5 01	6 30	2 31	9 13	3 53	.....	14	14 44.8	-15 14	6.7
Tue Dec 20/Wed Dec 21	4 15	20 52	22 21	5 02	6 31	2 36	9 18	4 34	18 06	7	15 40.1	-20 08	6.7
Wed Dec 21/Thu Dec 22	4 19	20 52	22 21	5 02	6 31	2 40	9 22	5 24	19 17	3	16 40.4	-23 56	6.7
Thu Dec 22/Fri Dec 23	4 23	20 53	22 22	5 03	6 32	2 45	9 27	6 23	20 29	0	17 45.1	-26 11	6.7
Fri Dec 23/Sat Dec 24	4 27	20 53	22 22	5 03	6 32	2 49	9 31	.....	21 38	1	18 52.2	-26 31	6.7
Sat Dec 24/Sun Dec 25	4 31	20 54	22 23	5 04	6 33	2 53	9 36	.....	22 39	4	19 58.8	-24 50	6.7
Sun Dec 25/Mon Dec 26	4 35	20 54	22 23	5 04	6 33	2 58	9 40	.....	23 31	10	21 02.2	-21 22	6.7
Mon Dec 26/Tue Dec 27	4 39	20 54	22 23	5 05	6 34	3 02	9 45	.....	0 14	19	22 01.2	-16 32	6.7
Tue Dec 27/Wed Dec 28	4 43	20 55	22 24	5 06	6 35	3 06	9 50	.....	0 50	29	22 55.7	-10 48	6.7
Wed Dec 28/Thu Dec 29	4 47	20 55	22 24	5 07	6 35	3 10	9 54	.....	1 23	39	23 46.7	- 4 38	6.7
Thu Dec 29/Fri Dec 30	4 51	20 55	22 24	5 07	6 36	3 15	9 59	.....	1 53	50	0 35.3	1 37	6.7
Fri Dec 30/Sat Dec 31	4 55	20 56	22 24	5 08	6 37	3 19	10 04	.....	2 23	61	1 22.8	7 41	6.7
Sat Dec 31/Sun Jan 01	4 59	20 56	22 24	5 09	6 37	3 23	10 09	.....	2 54	71	2 10.4	13 19	6.7