

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:

***** 2020 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 2020, 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 26	2 16	Jan 03	1 47	Jan 10	16 23	Jan 17	10 01
Jan 24	18 44	Feb 01	22 43	Feb 09	4 35	Feb 15	19 19
Feb 23	12 34	Mar 02	16 59	Mar 09	13 49	Mar 16	5 36
Mar 24	5 30	Apr 01	6 22	Apr 07	22 36	Apr 14	18 57
Apr 22	22 27	Apr 30	16 39	May 07	6 46	May 14	10 03
May 22	13 40	May 29	23 30	Jun 05	15 13	Jun 13	2 25
Jun 21	2 42	Jun 28	4 17	Jul 05	0 45	Jul 12	19 31
Jul 20	13 34	Jul 27	8 34	Aug 03	12 00	Aug 11	12 48
Aug 18	22 42	Aug 25	13 59	Sep 02	1 23	Sep 10	5 28
Sep 17	7 01	Sep 23	21 57	Oct 01	17 07	Oct 09	20 41
Oct 16	16 32	Oct 23	10 24	Oct 31	11 51	Nov 08	10 48
Nov 15	2 09	Nov 22	1 46	Nov 30	6 32	Dec 07	21 38
Dec 14	13 19	Dec 21	20 43	Dec 30	0 30	Jan 06	6 39

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.

***** 2020 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
Wed Jan 01/Thu Jan 02	5 02	20 56	22 24	5 10	6 38	3 26	10 12	.....	1 25	39	0 03.5	- 4 33	6.8
Thu Jan 02/Fri Jan 03	5 06	20 56	22 24	5 10	6 39	3 30	10 17	.....	1 54	49	0 47.3	0 06	6.8
Fri Jan 03/Sat Jan 04	5 10	20 56	22 25	5 11	6 39	3 34	10 22	.....	2 24	58	1 31.4	4 48	6.8
Sat Jan 04/Sun Jan 05	5 13	20 57	22 25	5 12	6 40	3 38	10 27	.....	2 55	68	2 16.7	9 26	6.8
Sun Jan 05/Mon Jan 06	5 17	20 57	22 24	5 13	6 41	3 42	10 31	.....	3 29	77	3 04.2	13 49	6.8
Mon Jan 06/Tue Jan 07	5 21	20 57	22 24	5 14	6 42	3 46	10 36	.....	4 07	85	3 54.7	17 44	6.8
Tue Jan 07/Wed Jan 08	5 25	20 57	22 24	5 15	6 42	3 49	10 41	17 51	4 51	91	4 48.7	20 55	6.8
Wed Jan 08/Thu Jan 09	5 29	20 57	22 24	5 16	6 43	3 53	10 46	18 52	5 41	97	5 46.3	23 06	6.9
Thu Jan 09/Fri Jan 10	5 33	20 57	22 24	5 17	6 44	3 57	10 51	19 53	.....	99	6 46.8	23 59	6.9
Fri Jan 10/Sat Jan 11	5 37	20 57	22 24	5 18	6 45	4 01	10 56	20 52	.....	100	7 48.8	23 24	6.9
Sat Jan 11/Sun Jan 12	5 41	20 57	22 24	5 19	6 46	4 04	11 01	21 46	.....	97	8 50.6	21 18	6.9
Sun Jan 12/Mon Jan 13	5 45	20 57	22 23	5 20	6 47	4 08	11 06	22 35	.....	93	9 50.7	17 52	7.0
Mon Jan 13/Tue Jan 14	5 49	20 57	22 23	5 21	6 48	4 12	11 11	23 19	.....	85	10 48.3	13 23	7.0
Tue Jan 14/Wed Jan 15	5 53	20 57	22 23	5 22	6 48	4 15	11 16	23 59	.....	76	11 43.4	8 11	7.0
Wed Jan 15/Thu Jan 16	5 57	20 56	22 22	5 24	6 49	4 19	11 21	0 36	.....	65	12 36.5	2 38	7.0
Thu Jan 16/Fri Jan 17	6 01	20 56	22 22	5 25	6 50	4 22	11 26	1 12	.....	54	13 28.5	- 2 56	7.0
Fri Jan 17/Sat Jan 18	6 05	20 56	22 21	5 26	6 51	4 26	11 31	1 48	.....	43	14 20.3	- 8 13	7.1
Sat Jan 18/Sun Jan 19	6 09	20 56	22 21	5 27	6 52	4 29	11 37	2 26	.....	32	15 12.5	-12 58	7.1
Sun Jan 19/Mon Jan 20	6 13	20 55	22 20	5 28	6 53	4 33	11 42	3 07	.....	23	16 05.8	-16 57	7.1
Mon Jan 20/Tue Jan 21	6 17	20 55	22 20	5 29	6 54	4 36	11 47	3 52	.....	14	17 00.3	-19 57	7.2
Tue Jan 21/Wed Jan 22	6 21	20 55	22 19	5 30	6 55	4 39	11 52	4 41	18 25	8	17 55.7	-21 50	7.2
Wed Jan 22/Thu Jan 23	6 24	20 54	22 18	5 32	6 56	4 43	11 57	5 34	19 22	3	18 51.2	-22 29	7.2
Thu Jan 23/Fri Jan 24	6 28	20 54	22 18	5 33	6 56	4 46	12 02	6 30	20 15	1	19 46.0	-21 56	7.2
Fri Jan 24/Sat Jan 25	6 32	20 54	22 17	5 34	6 57	4 49	12 07	.....	21 02	0	20 39.0	-20 16	7.3
Sat Jan 25/Sun Jan 26	6 36	20 53	22 16	5 35	6 58	4 52	12 12	.....	21 43	1	21 29.8	-17 38	7.3
Sun Jan 26/Mon Jan 27	6 40	20 53	22 16	5 36	6 59	4 56	12 17	.....	22 21	5	22 18.2	-14 14	7.3
Mon Jan 27/Tue Jan 28	6 44	20 52	22 15	5 37	7 00	4 59	12 23	.....	22 54	9	23 04.4	-10 17	7.4
Tue Jan 28/Wed Jan 29	6 48	20 52	22 14	5 39	7 01	5 02	12 28	.....	23 25	16	23 49.0	- 5 56	7.4
Wed Jan 29/Thu Jan 30	6 52	20 51	22 13	5 40	7 02	5 05	12 33	.....	23 54	23	0 32.6	- 1 21	7.4
Thu Jan 30/Fri Jan 31	6 56	20 51	22 12	5 41	7 03	5 08	12 38	.....	0 24	31	1 16.0	3 19	7.5
Fri Jan 31/Sat Feb 01	7 00	20 50	22 12	5 42	7 04	5 11	12 43	.....	0 54	41	2 00.1	7 55	7.5

***** 2020 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
Sat Feb 01/Sun Feb 02	7 04	20 49	22 11	5 43	7 05	5 14	12 48	.....	1 26	50	2 45.8	12 19	7.5
Sun Feb 02/Mon Feb 03	7 08	20 49	22 10	5 44	7 06	5 17	12 53	.....	2 01	60	3 33.8	16 20	7.6
Mon Feb 03/Tue Feb 04	7 12	20 48	22 09	5 46	7 06	5 20	12 58	.....	2 41	70	4 25.1	19 46	7.6
Tue Feb 04/Wed Feb 05	7 16	20 47	22 08	5 47	7 07	5 23	13 03	.....	3 27	79	5 20.0	22 21	7.6
Wed Feb 05/Thu Feb 06	7 20	20 47	22 07	5 48	7 08	5 26	13 08	17 35	4 19	87	6 18.5	23 49	7.7
Thu Feb 06/Fri Feb 07	7 24	20 46	22 06	5 49	7 09	5 29	13 14	18 34	5 19	93	7 19.8	23 55	7.7
Fri Feb 07/Sat Feb 08	7 28	20 45	22 05	5 50	7 10	5 32	13 19	19 31	6 24	98	8 22.4	22 28	7.8
Sat Feb 08/Sun Feb 09	7 31	20 44	22 04	5 51	7 11	5 35	13 24	20 23	.....	100	9 24.5	19 32	7.8
Sun Feb 09/Mon Feb 10	7 35	20 44	22 03	5 52	7 12	5 38	13 29	21 11	.....	99	10 25.0	15 17	7.8
Mon Feb 10/Tue Feb 11	7 39	20 43	22 02	5 53	7 12	5 41	13 34	21 53	.....	95	11 23.2	10 06	7.9
Tue Feb 11/Wed Feb 12	7 43	20 42	22 01	5 55	7 13	5 44	13 39	22 33	.....	88	12 19.1	4 23	7.9
Wed Feb 12/Thu Feb 13	7 47	20 41	22 00	5 56	7 14	5 47	13 44	23 11	.....	79	13 13.5	- 1 28	7.9
Thu Feb 13/Fri Feb 14	7 51	20 40	21 59	5 57	7 15	5 49	13 49	23 48	.....	69	14 07.1	- 7 04	8.0
Fri Feb 14/Sat Feb 15	7 55	20 39	21 57	5 58	7 16	5 52	13 54	0 26	.....	58	15 00.6	-12 07	8.0
Sat Feb 15/Sun Feb 16	7 59	20 38	21 56	5 59	7 17	5 55	13 59	1 07	.....	47	15 54.6	-16 21	8.0
Sun Feb 16/Mon Feb 17	8 03	20 38	21 55	6 00	7 17	5 58	14 04	1 50	.....	37	16 49.2	-19 35	8.1
Mon Feb 17/Tue Feb 18	8 07	20 37	21 54	6 01	7 18	6 01	14 09	2 38	.....	27	17 44.4	-21 41	8.1
Tue Feb 18/Wed Feb 19	8 11	20 36	21 53	6 02	7 19	6 03	14 14	3 29	17 18	18	18 39.5	-22 34	8.2
Wed Feb 19/Thu Feb 20	8 15	20 35	21 52	6 03	7 20	6 06	14 19	4 24	18 11	11	19 33.8	-22 15	8.2
Thu Feb 20/Fri Feb 21	8 19	20 34	21 50	6 04	7 21	6 09	14 24	5 20	18 59	6	20 26.5	-20 49	8.2
Fri Feb 21/Sat Feb 22	8 23	20 33	21 49	6 05	7 21	6 12	14 29	6 16	19 42	2	21 17.2	-18 24	8.3
Sat Feb 22/Sun Feb 23	8 27	20 32	21 48	6 06	7 22	6 14	14 34	.....	20 20	0	22 05.7	-15 11	8.3
Sun Feb 23/Mon Feb 24	8 31	20 31	21 47	6 07	7 23	6 17	14 38	.....	20 54	0	22 52.1	-11 21	8.3
Mon Feb 24/Tue Feb 25	8 35	20 30	21 45	6 08	7 24	6 20	14 43	.....	21 26	2	23 36.8	- 7 05	8.4
Tue Feb 25/Wed Feb 26	8 39	20 28	21 44	6 09	7 24	6 22	14 48	.....	21 56	5	0 20.4	- 2 33	8.4
Wed Feb 26/Thu Feb 27	8 42	20 27	21 43	6 10	7 25	6 25	14 53	.....	22 25	10	1 03.5	2 06	8.4
Thu Feb 27/Fri Feb 28	8 46	20 26	21 42	6 11	7 26	6 28	14 58	.....	22 54	17	1 46.9	6 43	8.5
Fri Feb 28/Sat Feb 29	8 50	20 25	21 40	6 11	7 27	6 30	15 03	.....	23 25	24	2 31.4	11 09	8.5
Sat Feb 29/Sun Mar 01	8 54	20 24	21 39	6 12	7 27	6 33	15 08	.....	23 58	33	3 17.7	15 15	8.6

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.

***** 2020 MARCH *****

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 Mar 01/Mon Mar 02	8 58	20 23	21 38	6 13	7 28	6 36	15 12	.....	0 35	42	4 06.6	18 49	8.6
Mon Mar 02/Tue Mar 03	9 02	20 22	21 37	6 14	7 29	6 38	15 17	.....	1 17	52	4 58.6	21 39	8.6
Tue Mar 03/Wed Mar 04	9 06	20 21	21 35	6 15	7 30	6 41	15 22	.....	2 05	63	5 54.0	23 31	8.7
Wed Mar 04/Thu Mar 05	9 10	20 20	21 34	6 16	7 30	6 44	15 27	.....	3 00	73	6 52.5	24 10	8.7
Thu Mar 05/Fri Mar 06	9 14	20 18	21 33	6 17	7 31	6 46	15 32	17 15	4 01	82	7 53.1	23 25	8.7
Fri Mar 06/Sat Mar 07	9 18	20 17	21 31	6 17	7 32	6 49	15 36	18 08	5 08	90	8 54.6	21 10	8.8
Sat Mar 07/Sun Mar 08*	9 22	20 16	21 30	5 18	6 32	6 52	15 41	18 57	5 17	96	9 55.6	17 29	8.8
Sun Mar 08/Mon Mar 09	10 26	19 15	20 29	5 19	6 33	6 54	15 46	18 43	6 27	99	10 56.9	12 24	8.8
Mon Mar 09/Tue Mar 10	10 30	19 14	20 28	5 20	6 34	6 57	15 51	19 24	.....	99	11 55.0	6 41	8.9
Tue Mar 10/Wed Mar 11	10 34	19 13	20 26	5 21	6 34	7 00	15 55	20 04	.....	97	12 51.9	0 35	8.9
Wed Mar 11/Thu Mar 12	10 38	19 11	20 25	5 21	6 35	7 02	16 00	20 43	.....	91	13 48.1	- 5 27	8.9
Thu Mar 12/Fri Mar 13	10 42	19 10	20 24	5 22	6 36	7 05	16 05	21 22	.....	83	14 44.1	-11 00	9.0
Fri Mar 13/Sat Mar 14	10 46	19 09	20 22	5 23	6 36	7 07	16 09	22 03	.....	73	15 40.4	-15 43	9.0
Sat Mar 14/Sun Mar 15	10 50	19 08	20 21	5 24	6 37	7 10	16 14	22 47	.....	63	16 37.2	-19 22	9.0
Sun Mar 15/Mon Mar 16	10 54	19 07	20 20	5 24	6 38	7 13	16 19	23 34	.....	52	17 34.1	-21 46	9.1
Mon Mar 16/Tue Mar 17	10 58	19 05	20 19	5 25	6 38	7 15	16 23	0 25	.....	41	18 30.6	-22 52	9.1
Tue Mar 17/Wed Mar 18	11 01	19 04	20 17	5 26	6 39	7 18	16 28	1 19	.....	32	19 25.8	-22 43	9.1
Wed Mar 18/Thu Mar 19	11 05	19 03	20 16	5 26	6 39	7 21	16 33	2 15	.....	23	20 19.0	-21 25	9.2
Thu Mar 19/Fri Mar 20	11 09	19 02	20 15	5 27	6 40	7 23	16 37	3 11	16 42	15	21 10.0	-19 06	9.2
Fri Mar 20/Sat Mar 21	11 13	19 01	20 13	5 28	6 41	7 26	16 42	4 06	17 21	9	21 58.5	-15 59	9.2
Sat Mar 21/Sun Mar 22	11 17	18 59	20 12	5 28	6 41	7 29	16 47	5 01	17 56	4	22 44.8	-12 13	9.3
Sun Mar 22/Mon Mar 23	11 21	18 58	20 11	5 29	6 42	7 31	16 51	5 54	18 28	1	23 29.4	- 8 00	9.3
Mon Mar 23/Tue Mar 24	11 25	18 57	20 10	5 30	6 43	7 34	16 56	6 47	18 58	0	0 12.8	- 3 29	9.3
Tue Mar 24/Wed Mar 25	11 29	18 56	20 08	5 30	6 43	7 37	17 00	.....	19 27	1	0 55.7	1 11	9.4
Wed Mar 25/Thu Mar 26	11 33	18 54	20 07	5 31	6 44	7 39	17 05	.....	19 56	3	1 38.7	5 50	9.4
Thu Mar 26/Fri Mar 27	11 37	18 53	20 06	5 32	6 44	7 42	17 10	.....	20 27	7	2 22.6	10 19	9.4
Fri Mar 27/Sat Mar 28	11 41	18 52	20 05	5 32	6 45	7 45	17 14	.....	20 59	12	3 08.0	14 29	9.5
Sat Mar 28/Sun Mar 29	11 45	18 51	20 03	5 33	6 46	7 48	17 19	.....	21 34	19	3 55.6	18 08	9.5
Sun Mar 29/Mon Mar 30	11 49	18 50	20 02	5 34	6 46	7 50	17 23	.....	22 14	27	4 45.8	21 07	9.5
Mon Mar 30/Tue Mar 31	11 53	18 48	20 01	5 34	6 47	7 53	17 28	.....	22 58	36	5 38.9	23 11	9.6
Tue Mar 31/Wed Apr 01	11 57	18 47	20 00	5 35	6 47	7 56	17 32	.....	23 49	47	6 34.6	24 10	9.6

***** 2020 APRIL *****

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 Apr 01/Thu Apr 02	12 01	18 46	19 59	5 35	6 48	7 58	17 37	.....	0 46	57	7 32.4	23 52	9.6
Thu Apr 02/Fri Apr 03	12 05	18 45	19 57	5 36	6 49	8 01	17 41	.....	1 48	68	8 31.3	22 11	9.6
Fri Apr 03/Sat Apr 04	12 08	18 44	19 56	5 37	6 49	8 04	17 46	.....	2 54	78	9 30.5	19 08	9.7
Sat Apr 04/Sun Apr 05	12 12	18 43	19 55	5 37	6 50	8 07	17 51	16 32	4 02	87	10 29.0	14 48	9.7
Sun Apr 05/Mon Apr 06	12 16	18 41	19 54	5 38	6 50	8 10	17 55	17 15	5 11	94	11 26.8	9 28	9.7
Mon Apr 06/Tue Apr 07	12 20	18 40	19 53	5 38	6 51	8 12	18 00	17 54	6 20	98	12 23.8	3 27	9.8
Tue Apr 07/Wed Apr 08	12 24	18 39	19 52	5 39	6 52	8 15	18 04	18 33	7 30	100	13 20.6	- 2 47	9.8
Wed Apr 08/Thu Apr 09	12 28	18 38	19 50	5 39	6 52	8 18	18 09	19 12	.....	98	14 17.8	- 8 47	9.8
Thu Apr 09/Fri Apr 10	12 32	18 37	19 49	5 40	6 53	8 21	18 13	19 53	.....	93	15 15.8	-14 08	9.8
Fri Apr 10/Sat Apr 11	12 36	18 36	19 48	5 41	6 53	8 24	18 18	20 37	.....	86	16 14.7	-18 27	9.9
Sat Apr 11/Sun Apr 12	12 40	18 35	19 47	5 41	6 54	8 27	18 22	21 25	.....	78	17 14.1	-21 28	9.9
Sun Apr 12/Mon Apr 13	12 44	18 33	19 46	5 42	6 55	8 29	18 27	22 16	.....	68	18 13.2	-23 04	9.9
Mon Apr 13/Tue Apr 14	12 48	18 32	19 45	5 42	6 55	8 32	18 31	23 11	.....	57	19 10.8	-23 17	10.0
Tue Apr 14/Wed Apr 15	12 52	18 31	19 44	5 43	6 56	8 35	18 36	0 07	.....	47	20 06.1	-22 14	10.0
Wed Apr 15/Thu Apr 16	12 56	18 30	19 43	5 43	6 56	8 38	18 40	1 04	.....	37	20 58.6	-20 05	10.0
Thu Apr 16/Fri Apr 17	13 00	18 29	19 42	5 44	6 57	8 41	18 45	2 01	.....	28	21 48.2	-17 05	10.0
Fri Apr 17/Sat Apr 18	13 04	18 28	19 41	5 44	6 58	8 44	18 49	2 56	.....	20	22 35.2	-13 23	10.1
Sat Apr 18/Sun Apr 19	13 08	18 27	19 40	5 45	6 58	8 47	18 54	3 49	16 31	13	23 20.1	- 9 13	10.1
Sun Apr 19/Mon Apr 20	13 12	18 26	19 39	5 46	6 59	8 50	18 58	4 42	17 02	8	0 03.5	- 4 43	10.1
Mon Apr 20/Tue Apr 21	13 16	18 25	19 38	5 46	6 59	8 53	19 03	5 34	17 31	3	0 46.4	- 0 02	10.1
Tue Apr 21/Wed Apr 22	13 19	18 24	19 37	5 47	7 00	8 56	19 07	6 27	17 59	1	1 29.2	4 40	10.2
Wed Apr 22/Thu Apr 23	13 23	18 23	19 36	5 47	7 01	8 59	19 12	7 20	18 29	0	2 12.8	9 15	10.2
Thu Apr 23/Fri Apr 24	13 27	18 22	19 35	5 48	7 01	9 02	19 16	.....	19 00	1	2 57.9	13 33	10.2
Fri Apr 24/Sat Apr 25	13 31	18 21	19 34	5 48	7 02	9 05	19 20	.....	19 35	4	3 45.0	17 23	10.2
Sat Apr 25/Sun Apr 26	13 35	18 20	19 34	5 49	7 02	9 08	19 25	.....	20 13	8	4 34.5	20 33	10.3
Sun Apr 26/Mon Apr 27	13 39	18 19	19 33	5 49	7 03	9 11	19 29	.....	20 56	15	5 26.6	22 51	10.3
Mon Apr 27/Tue Apr 28	13 43	18 18	19 32	5 50	7 04	9 14	19 34	.....	21 44	22	6 21.0	24 07	10.3
Tue Apr 28/Wed Apr 29	13 47	18 17	19 31	5 50	7 04	9 17	19 38	.....	22 39	32	7 17.3	24 09	10.3
Wed Apr 29/Thu Apr 30	13 51	18 16	19 30	5 51	7 05	9 21	19 43	.....	23 38	42	8 14.4	22 53	10.3
Thu Apr 30/Fri May 01	13 55	18 16	19 30	5 51	7 06	9 24	19 47	.....	0 40	53	9 11.6	20 19	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.

***** 2020 MAY *****

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 May 01/Sat May 02	13 59	18 15	19 29	5 52	7 06	9 27	19 52	.....	1 45	64	10 08.2	16 31	10.4
Sat May 02/Sun May 03	14 03	18 14	19 28	5 52	7 07	9 30	19 56	.....	2 51	74	11 04.0	11 41	10.4
Sun May 03/Mon May 04	14 07	18 13	19 27	5 53	7 07	9 33	20 01	.....	3 58	84	11 59.2	6 03	10.4
Mon May 04/Tue May 05	14 11	18 12	19 27	5 54	7 08	9 37	20 05	16 26	5 06	92	12 54.5	- 0 01	10.4
Tue May 05/Wed May 06	14 15	18 11	19 26	5 54	7 09	9 40	20 10	17 04	6 15	97	13 50.4	- 6 08	10.5
Wed May 06/Thu May 07	14 19	18 11	19 25	5 55	7 09	9 43	20 14	17 43	7 25	100	14 47.8	-11 53	10.5
Thu May 07/Fri May 08	14 23	18 10	19 25	5 55	7 10	9 46	20 19	18 25	.....	99	15 46.9	-16 49	10.5
Fri May 08/Sat May 09	14 26	18 09	19 24	5 56	7 11	9 50	20 23	19 12	.....	96	16 47.4	-20 35	10.5
Sat May 09/Sun May 10	14 30	18 09	19 23	5 56	7 11	9 53	20 28	20 02	.....	90	17 48.6	-22 54	10.5
Sun May 10/Mon May 11	14 34	18 08	19 23	5 57	7 12	9 56	20 32	20 57	.....	82	18 49.1	-23 42	10.6
Mon May 11/Tue May 12	14 38	18 07	19 22	5 57	7 12	10 00	20 36	21 55	.....	73	19 47.4	-23 05	10.6
Tue May 12/Wed May 13	14 42	18 07	19 22	5 58	7 13	10 03	20 41	22 54	.....	63	20 42.7	-21 13	10.6
Wed May 13/Thu May 14	14 46	18 06	19 21	5 58	7 14	10 07	20 45	23 52	.....	53	21 34.5	-18 21	10.6
Thu May 14/Fri May 15	14 50	18 05	19 21	5 59	7 14	10 10	20 50	0 48	.....	44	22 23.1	-14 45	10.6
Fri May 15/Sat May 16	14 54	18 05	19 20	5 59	7 15	10 14	20 54	1 43	.....	34	23 09.1	-10 37	10.6
Sat May 16/Sun May 17	14 58	18 04	19 20	6 00	7 15	10 17	20 59	2 36	.....	26	23 53.1	- 6 08	10.7
Sun May 17/Mon May 18	15 02	18 04	19 19	6 00	7 16	10 21	21 03	3 29	.....	18	0 36.1	- 1 26	10.7
Mon May 18/Tue May 19	15 06	18 03	19 19	6 01	7 17	10 24	21 08	4 21	16 02	11	1 18.9	3 19	10.7
Tue May 19/Wed May 20	15 10	18 03	19 19	6 01	7 17	10 28	21 12	5 14	16 31	6	2 02.3	7 59	10.7
Wed May 20/Thu May 21	15 14	18 02	19 18	6 02	7 18	10 31	21 16	6 08	17 02	2	2 47.0	12 24	10.7
Thu May 21/Fri May 22	15 18	18 02	19 18	6 02	7 18	10 35	21 21	7 04	17 35	0	3 33.7	16 25	10.7
Fri May 22/Sat May 23	15 22	18 01	19 18	6 03	7 19	10 38	21 25	8 01	18 12	0	4 22.9	19 48	10.8
Sat May 23/Sun May 24	15 26	18 01	19 17	6 03	7 20	10 42	21 30	.....	18 54	2	5 14.8	22 22	10.8
Sun May 24/Mon May 25	15 30	18 01	19 17	6 04	7 20	10 46	21 34	.....	19 41	6	6 09.0	23 54	10.8
Mon May 25/Tue May 26	15 34	18 00	19 17	6 04	7 21	10 49	21 39	.....	20 34	11	7 05.1	24 14	10.8
Tue May 26/Wed May 27	15 37	18 00	19 16	6 05	7 21	10 53	21 43	.....	21 32	19	8 01.9	23 16	10.8
Wed May 27/Thu May 28	15 41	18 00	19 16	6 05	7 22	10 57	21 47	.....	22 33	28	8 58.4	21 01	10.8
Thu May 28/Fri May 29	15 45	17 59	19 16	6 05	7 22	11 01	21 52	.....	23 37	38	9 54.1	17 35	10.8
Fri May 29/Sat May 30	15 49	17 59	19 16	6 06	7 23	11 04	21 56	.....	0 41	49	10 48.5	13 07	10.8
Sat May 30/Sun May 31	15 53	17 59	19 16	6 06	7 23	11 08	22 01	.....	1 46	61	11 42.0	7 52	10.8
Sun May 31/Mon Jun 01	15 57	17 59	19 16	6 07	7 24	11 12	22 05	.....	2 51	72	12 35.1	2 06	10.9

***** 2020 JUNE *****

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 Jun 01/Tue Jun 02	16 01	17 58	19 15	6 07	7 24	11 16	22 09	.....	3 57	82	13 28.7	- 3 52	10.9
Tue Jun 02/Wed Jun 03	16 05	17 58	19 15	6 08	7 25	11 20	22 14	.....	5 04	90	14 23.7	- 9 40	10.9
Wed Jun 03/Thu Jun 04	16 09	17 58	19 15	6 08	7 25	11 24	22 18	16 17	6 12	96	15 20.8	-14 55	10.9
Thu Jun 04/Fri Jun 05	16 13	17 58	19 15	6 08	7 26	11 27	22 22	17 00	7 21	99	16 20.1	-19 12	10.9
Fri Jun 05/Sat Jun 06	16 17	17 58	19 15	6 09	7 26	11 31	22 27	17 48	.....	100	17 21.1	-22 13	10.9
Sat Jun 06/Sun Jun 07	16 21	17 58	19 15	6 09	7 27	11 35	22 31	18 41	.....	97	18 22.8	-23 43	10.9
Sun Jun 07/Mon Jun 08	16 25	17 58	19 15	6 10	7 27	11 39	22 35	19 39	.....	93	19 23.5	-23 42	10.9
Mon Jun 08/Tue Jun 09	16 29	17 58	19 15	6 10	7 28	11 43	22 40	20 39	.....	86	20 21.5	-22 17	10.9
Tue Jun 09/Wed Jun 10	16 33	17 58	19 15	6 10	7 28	11 47	22 44	21 39	.....	78	21 16.2	-19 42	10.9
Wed Jun 10/Thu Jun 11	16 37	17 58	19 15	6 11	7 28	11 51	22 48	22 37	.....	69	22 07.2	-16 15	10.9
Thu Jun 11/Fri Jun 12	16 41	17 58	19 15	6 11	7 29	11 55	22 53	23 33	.....	60	22 54.9	-12 10	10.9
Fri Jun 12/Sat Jun 13	16 44	17 58	19 15	6 11	7 29	11 59	22 57	0 28	.....	50	23 40.2	- 7 42	10.9
Sat Jun 13/Sun Jun 14	16 48	17 58	19 16	6 12	7 30	12 03	23 01	1 21	.....	41	0 23.9	- 2 59	10.9
Sun Jun 14/Mon Jun 15	16 52	17 58	19 16	6 12	7 30	12 07	23 05	2 13	.....	32	1 06.9	1 48	10.9
Mon Jun 15/Tue Jun 16	16 56	17 58	19 16	6 12	7 30	12 11	23 10	3 06	.....	23	1 50.1	6 31	10.9
Tue Jun 16/Wed Jun 17	17 00	17 58	19 16	6 13	7 30	12 15	23 14	3 59	.....	16	2 34.4	11 03	10.9
Wed Jun 17/Thu Jun 18	17 04	17 58	19 16	6 13	7 31	12 20	23 18	4 55	.....	9	3 20.5	15 13	10.9
Thu Jun 18/Fri Jun 19	17 08	17 58	19 16	6 13	7 31	12 24	23 22	5 52	16 10	5	4 09.1	18 49	10.9
Fri Jun 19/Sat Jun 20	17 12	17 59	19 16	6 13	7 31	12 28	23 26	6 50	16 50	1	5 00.5	21 40	10.9
Sat Jun 20/Sun Jun 21	17 16	17 59	19 17	6 14	7 31	12 32	23 31	7 48	17 35	0	5 54.7	23 31	10.9
Sun Jun 21/Mon Jun 22	17 20	17 59	19 17	6 14	7 32	12 36	23 35	.....	18 27	1	6 51.0	24 12	10.9
Mon Jun 22/Tue Jun 23	17 24	17 59	19 17	6 14	7 32	12 40	23 39	.....	19 25	4	7 48.4	23 33	10.9
Tue Jun 23/Wed Jun 24	17 28	18 00	19 17	6 14	7 32	12 44	23 43	.....	20 26	9	8 45.7	21 35	10.9
Wed Jun 24/Thu Jun 25	17 32	18 00	19 18	6 14	7 32	12 49	23 47	.....	21 30	16	9 41.9	18 22	10.9
Thu Jun 25/Fri Jun 26	17 36	18 00	19 18	6 14	7 32	12 53	23 51	.....	22 34	25	10 36.5	14 07	10.9
Fri Jun 26/Sat Jun 27	17 40	18 00	19 18	6 14	7 32	12 57	23 55	.....	23 39	36	11 29.6	9 04	10.9
Sat Jun 27/Sun Jun 28	17 44	18 01	19 19	6 15	7 32	13 01	23 59	.....	0 43	47	12 21.8	3 30	10.9
Sun Jun 28/Mon Jun 29	17 48	18 01	19 19	6 15	7 32	13 06	0 03	.....	1 47	59	13 13.8	- 2 18	10.9
Mon Jun 29/Tue Jun 30	17 51	18 01	19 19	6 15	7 32	13 10	0 07	.....	2 52	70	14 06.7	- 8 00	10.9
Tue Jun 30/Wed Jul 01	17 55	18 02	19 20	6 15	7 32	13 14	0 11	.....	3 58	80	15 01.3	-13 18	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.

***** 2020 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	
Wed Jul 01/Thu Jul 02		17 59	18 02	19 20	6 15	7 32	13 18	0 15	.....	5 04	88	15 58.1	-17 50	10.9
Thu Jul 02/Fri Jul 03		18 03	18 03	19 20	6 15	7 32	13 23	0 19	.....	6 11	95	16 57.2	-21 17	10.9
Fri Jul 03/Sat Jul 04		18 07	18 03	19 21	6 15	7 32	13 27	0 23	16 29	7 14	99	17 57.9	-23 22	10.9
Sat Jul 04/Sun Jul 05		18 11	18 03	19 21	6 15	7 32	13 31	0 27	17 24	8 13	100	18 58.8	-23 57	10.9
Sun Jul 05/Mon Jul 06		18 15	18 04	19 21	6 15	7 32	13 36	0 31	18 23	.....	99	19 58.2	-23 04	10.9
Mon Jul 06/Tue Jul 07		18 19	18 04	19 22	6 15	7 32	13 40	0 35	19 23	.....	95	20 54.8	-20 54	10.9
Tue Jul 07/Wed Jul 08		18 23	18 05	19 22	6 15	7 32	13 44	0 39	20 23	.....	90	21 48.0	-17 42	10.9
Wed Jul 08/Thu Jul 09		18 27	18 05	19 22	6 14	7 32	13 49	0 42	21 21	.....	83	22 37.8	-13 45	10.9
Thu Jul 09/Fri Jul 10		18 31	18 06	19 23	6 14	7 31	13 53	0 46	22 17	.....	75	23 24.7	- 9 18	10.9
Fri Jul 10/Sat Jul 11		18 35	18 06	19 23	6 14	7 31	13 57	0 50	23 11	.....	66	0 09.5	- 4 35	10.8
Sat Jul 11/Sun Jul 12		18 39	18 07	19 24	6 14	7 31	14 02	0 54	0 04	.....	57	0 53.1	0 15	10.8
Sun Jul 12/Mon Jul 13		18 43	18 07	19 24	6 14	7 31	14 06	0 58	0 57	.....	47	1 36.3	5 02	10.8
Mon Jul 13/Tue Jul 14		18 47	18 08	19 25	6 14	7 30	14 11	1 01	1 50	.....	38	2 20.2	9 39	10.8
Tue Jul 14/Wed Jul 15		18 51	18 08	19 25	6 13	7 30	14 15	1 05	2 44	.....	29	3 05.6	13 56	10.8
Wed Jul 15/Thu Jul 16		18 55	18 09	19 25	6 13	7 30	14 19	1 09	3 40	.....	21	3 53.2	17 44	10.8
Thu Jul 16/Fri Jul 17		18 59	18 09	19 26	6 13	7 29	14 24	1 12	4 37	.....	13	4 43.6	20 51	10.8
Fri Jul 17/Sat Jul 18		19 02	18 10	19 26	6 13	7 29	14 28	1 16	5 36	.....	7	5 37.0	23 02	10.8
Sat Jul 18/Sun Jul 19		19 06	18 10	19 27	6 12	7 29	14 32	1 20	6 34	16 17	3	6 33.0	24 06	10.8
Sun Jul 19/Mon Jul 20		19 10	18 11	19 27	6 12	7 28	14 37	1 23	7 29	17 13	0	7 30.8	23 51	10.7
Mon Jul 20/Tue Jul 21		19 14	18 11	19 28	6 12	7 28	14 41	1 27	.....	18 14	0	8 29.1	22 14	10.7
Tue Jul 21/Wed Jul 22		19 18	18 12	19 28	6 11	7 27	14 46	1 30	.....	19 18	3	9 26.6	19 18	10.7
Wed Jul 22/Thu Jul 23		19 22	18 13	19 29	6 11	7 27	14 50	1 34	.....	20 24	7	10 22.6	15 13	10.7
Thu Jul 23/Fri Jul 24		19 26	18 13	19 29	6 10	7 26	14 54	1 37	.....	21 30	14	11 16.9	10 15	10.7
Fri Jul 24/Sat Jul 25		19 30	18 14	19 30	6 10	7 26	14 59	1 41	.....	22 36	23	12 09.7	4 43	10.7
Sat Jul 25/Sun Jul 26		19 34	18 14	19 30	6 09	7 25	15 03	1 44	.....	23 40	34	13 01.8	- 1 04	10.7
Sun Jul 26/Mon Jul 27		19 38	18 15	19 30	6 09	7 24	15 08	1 48	.....	0 45	45	13 54.1	- 6 47	10.6
Mon Jul 27/Tue Jul 28		19 42	18 15	19 31	6 08	7 24	15 12	1 51	.....	1 50	57	14 47.4	-12 08	10.6
Tue Jul 28/Wed Jul 29		19 46	18 16	19 31	6 08	7 23	15 16	1 55	.....	2 55	68	15 42.5	-16 48	10.6
Wed Jul 29/Thu Jul 30		19 50	18 17	19 32	6 07	7 23	15 21	1 58	.....	4 01	78	16 39.6	-20 28	10.6
Thu Jul 30/Fri Jul 31		19 54	18 17	19 32	6 07	7 22	15 25	2 01	.....	5 04	86	17 38.5	-22 54	10.6
Fri Jul 31/Sat Aug 01		19 58	18 18	19 33	6 06	7 21	15 30	2 05	.....	6 03	93	18 38.1	-23 56	10.6

***** 2020 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	
Sat Aug 01/Sun Aug 02		20 02	18 18	19 33	6 06	7 20	15 34	2 08	16 11	6 57	97	19 37.3	-23 32	10.5
Sun Aug 02/Mon Aug 03		20 06	18 19	19 34	6 05	7 20	15 39	2 11	17 11	7 44	100	20 34.4	-21 47	10.5
Mon Aug 03/Tue Aug 04		20 09	18 19	19 34	6 04	7 19	15 43	2 15	18 11	.....	100	21 28.7	-18 55	10.5
Tue Aug 04/Wed Aug 05		20 13	18 20	19 35	6 04	7 18	15 47	2 18	19 10	.....	97	22 19.9	-15 10	10.5
Wed Aug 05/Thu Aug 06		20 17	18 21	19 35	6 03	7 17	15 52	2 21	20 07	.....	93	23 08.1	-10 49	10.5
Thu Aug 06/Fri Aug 07		20 21	18 21	19 36	6 02	7 17	15 56	2 24	21 02	.....	88	23 53.9	- 6 06	10.4
Fri Aug 07/Sat Aug 08		20 25	18 22	19 36	6 01	7 16	16 01	2 28	21 55	.....	81	0 38.2	- 1 14	10.4
Sat Aug 08/Sun Aug 09		20 29	18 22	19 37	6 01	7 15	16 05	2 31	22 48	.....	72	1 21.8	3 38	10.4
Sun Aug 09/Mon Aug 10		20 33	18 23	19 37	6 00	7 14	16 10	2 34	23 40	.....	64	2 05.6	8 21	10.4
Mon Aug 10/Tue Aug 11		20 37	18 23	19 38	5 59	7 13	16 14	2 37	0 34	.....	54	2 50.4	12 46	10.4
Tue Aug 11/Wed Aug 12		20 41	18 24	19 38	5 58	7 12	16 18	2 40	1 28	.....	45	3 37.0	16 44	10.3
Wed Aug 12/Thu Aug 13		20 45	18 25	19 39	5 57	7 11	16 23	2 43	2 25	.....	35	4 26.0	20 03	10.3
Thu Aug 13/Fri Aug 14		20 49	18 25	19 39	5 57	7 10	16 27	2 46	3 22	.....	26	5 17.9	22 33	10.3
Fri Aug 14/Sat Aug 15		20 53	18 26	19 39	5 56	7 09	16 32	2 49	4 20	.....	18	6 12.7	24 00	10.3
Sat Aug 15/Sun Aug 16		20 57	18 26	19 40	5 55	7 08	16 36	2 53	5 16	.....	11	7 09.7	24 13	10.2
Sun Aug 16/Mon Aug 17		21 01	18 27	19 40	5 54	7 07	16 40	2 56	6 09	.....	5	8 08.0	23 04	10.2
Mon Aug 17/Tue Aug 18		21 05	18 27	19 41	5 53	7 06	16 45	2 59	6 58	17 00	1	9 06.4	20 32	10.2
Tue Aug 18/Wed Aug 19		21 09	18 28	19 41	5 52	7 05	16 49	3 02	7 42	18 07	0	10 03.7	16 44	10.2
Wed Aug 19/Thu Aug 20		21 13	18 28	19 42	5 51	7 04	16 54	3 05	.....	19 15	2	10 59.6	11 54	10.2
Thu Aug 20/Fri Aug 21		21 17	18 29	19 42	5 50	7 03	16 58	3 08	.....	20 22	6	11 54.0	6 21	10.1
Fri Aug 21/Sat Aug 22		21 20	18 30	19 43	5 49	7 02	17 03	3 10	.....	21 29	13	12 47.4	0 27	10.1
Sat Aug 22/Sun Aug 23		21 24	18 30	19 43	5 48	7 01	17 07	3 13	.....	22 36	21	13 40.5	- 5 28	10.1
Sun Aug 23/Mon Aug 24		21 28	18 31	19 44	5 47	7 00	17 11	3 16	.....	23 42	32	14 34.3	-11 01	10.1
Mon Aug 24/Tue Aug 25		21 32	18 31	19 44	5 46	6 59	17 16	3 19	.....	0 49	43	15 29.2	-15 54	10.0
Tue Aug 25/Wed Aug 26		21 36	18 32	19 45	5 45	6 58	17 20	3 22	.....	1 54	54	16 25.7	-19 49	10.0
Wed Aug 26/Thu Aug 27		21 40	18 32	19 45	5 44	6 57	17 25	3 25	.....	2 58	65	17 23.7	-22 31	10.0
Thu Aug 27/Fri Aug 28		21 44	18 33	19 46	5 43	6 56	17 29	3 28	.....	3 58	75	18 22.5	-23 53	10.0
Fri Aug 28/Sat Aug 29		21 48	18 33	19 46	5 42	6 54	17 34	3 31	.....	4 52	84	19 20.8	-23 50	9.9
Sat Aug 29/Sun Aug 30		21 52	18 34	19 47	5 41	6 53	17 38	3 34	.....	5 41	91	20 17.7	-22 26	9.9
Sun Aug 30/Mon Aug 31		21 56	18 34	19 47	5 40	6 52	17 42	3 36	.....	6 23	96	21 12.1	-19 52	9.9
Mon Aug 31/Tue Sep 01		22 00	18 35	19 48	5 38	6 51	17 47	3 39	17 01	7 01	99	22 03.6	-16 22	9.8

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.

***** 2020 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
Tue Sep 01/Wed Sep 02	22 04	18 36	19 48	5 37	6 50	17 51	3 42	17 58	7 34	100	22 52.4	-12 10	9.8
Wed Sep 02/Thu Sep 03	22 08	18 36	19 49	5 36	6 49	17 56	3 45	18 54	.....	99	23 38.8	- 7 30	9.8
Thu Sep 03/Fri Sep 04	22 12	18 37	19 49	5 35	6 47	18 00	3 48	19 48	.....	96	0 23.7	- 2 36	9.8
Fri Sep 04/Sat Sep 05	22 16	18 37	19 50	5 34	6 46	18 05	3 50	20 40	.....	92	1 07.6	2 21	9.7
Sat Sep 05/Sun Sep 06	22 20	18 38	19 50	5 33	6 45	18 09	3 53	21 33	.....	86	1 51.4	7 11	9.7
Sun Sep 06/Mon Sep 07	22 24	18 38	19 51	5 31	6 44	18 14	3 56	22 26	.....	78	2 35.9	11 45	9.7
Mon Sep 07/Tue Sep 08	22 27	18 39	19 51	5 30	6 43	18 18	3 58	23 20	.....	70	3 21.8	15 53	9.6
Tue Sep 08/Wed Sep 09	22 31	18 39	19 52	5 29	6 41	18 23	4 01	0 15	.....	61	4 09.8	19 25	9.6
Wed Sep 09/Thu Sep 10	22 35	18 40	19 52	5 28	6 40	18 27	4 04	1 11	.....	52	5 00.3	22 10	9.6
Thu Sep 10/Fri Sep 11	22 39	18 40	19 53	5 26	6 39	18 32	4 07	2 07	.....	42	5 53.4	23 58	9.6
Fri Sep 11/Sat Sep 12	22 43	18 41	19 53	5 25	6 38	18 36	4 09	3 03	.....	32	6 48.8	24 36	9.5
Sat Sep 12/Sun Sep 13	22 47	18 41	19 54	5 24	6 36	18 40	4 12	3 57	.....	23	7 45.9	23 57	9.5
Sun Sep 13/Mon Sep 14	22 51	18 42	19 55	5 23	6 35	18 45	4 15	4 47	.....	14	8 43.7	21 56	9.5
Mon Sep 14/Tue Sep 15	22 55	18 42	19 55	5 21	6 34	18 49	4 17	5 33	.....	7	9 41.1	18 35	9.4
Tue Sep 15/Wed Sep 16	22 59	18 43	19 56	5 20	6 33	18 54	4 20	6 15	16 53	3	10 37.6	14 05	9.4
Wed Sep 16/Thu Sep 17	23 03	18 44	19 56	5 19	6 31	18 59	4 23	6 55	18 01	0	11 33.0	8 40	9.4
Thu Sep 17/Fri Sep 18	23 07	18 44	19 57	5 17	6 30	19 03	4 25	.....	19 10	1	12 27.6	2 42	9.3
Fri Sep 18/Sat Sep 19	23 11	18 45	19 57	5 16	6 29	19 08	4 28	.....	20 18	4	13 22.0	- 3 27	9.3
Sat Sep 19/Sun Sep 20	23 15	18 45	19 58	5 15	6 28	19 12	4 31	.....	21 27	10	14 16.9	- 9 21	9.3
Sun Sep 20/Mon Sep 21	23 19	18 46	19 59	5 14	6 26	19 17	4 33	.....	22 36	19	15 12.8	-14 39	9.2
Mon Sep 21/Tue Sep 22	23 23	18 46	19 59	5 12	6 25	19 21	4 36	.....	23 45	29	16 10.2	-18 59	9.2
Tue Sep 22/Wed Sep 23	23 27	18 47	20 00	5 11	6 24	19 26	4 38	.....	0 51	39	17 08.9	-22 05	9.2
Wed Sep 23/Thu Sep 24	23 31	18 47	20 00	5 10	6 23	19 30	4 41	.....	1 53	50	18 08.1	-23 48	9.2
Thu Sep 24/Fri Sep 25	23 34	18 48	20 01	5 08	6 21	19 35	4 44	.....	2 50	61	19 06.7	-24 04	9.1
Fri Sep 25/Sat Sep 26	23 38	18 49	20 02	5 07	6 20	19 40	4 46	.....	3 40	71	20 03.7	-22 58	9.1
Sat Sep 26/Sun Sep 27	23 42	18 49	20 02	5 06	6 19	19 44	4 49	.....	4 24	80	20 58.2	-20 40	9.1
Sun Sep 27/Mon Sep 28	23 46	18 50	20 03	5 04	6 18	19 49	4 51	.....	5 02	87	21 49.9	-17 23	9.0
Mon Sep 28/Tue Sep 29	23 50	18 50	20 04	5 03	6 16	19 53	4 54	.....	5 36	93	22 38.8	-13 21	9.0
Tue Sep 29/Wed Sep 30	23 54	18 51	20 04	5 02	6 15	19 58	4 57	.....	6 07	97	23 25.4	- 8 47	9.0
Wed Sep 30/Thu Oct 01	23 58	18 51	20 05	5 00	6 14	20 03	4 59	17 42	6 37	99	0 10.3	- 3 55	8.9

***** 2020 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
Thu Oct 01/Fri Oct 02	0 02	18 52	20 06	4 59	6 13	20 07	5 02	18 35	7 05	100	0 54.4	1 05	8.9
Fri Oct 02/Sat Oct 03	0 06	18 53	20 06	4 58	6 11	20 12	5 04	19 27	.....	98	1 38.2	6 02	8.9
Sat Oct 03/Sun Oct 04	0 10	18 53	20 07	4 56	6 10	20 17	5 07	20 20	.....	95	2 22.6	10 45	8.8
Sun Oct 04/Mon Oct 05	0 14	18 54	20 08	4 55	6 09	20 21	5 10	21 14	.....	90	3 08.2	15 05	8.8
Mon Oct 05/Tue Oct 06	0 18	18 54	20 09	4 54	6 08	20 26	5 12	22 08	.....	84	3 55.6	18 50	8.7
Tue Oct 06/Wed Oct 07	0 22	18 55	20 09	4 52	6 07	20 31	5 15	23 03	.....	76	4 45.3	21 51	8.7
Wed Oct 07/Thu Oct 08	0 26	18 56	20 10	4 51	6 05	20 35	5 17	23 59	.....	68	5 37.2	23 57	8.7
Thu Oct 08/Fri Oct 09	0 30	18 56	20 11	4 50	6 04	20 40	5 20	0 54	.....	58	6 31.4	24 57	8.6
Fri Oct 09/Sat Oct 10	0 34	18 57	20 12	4 48	6 03	20 45	5 23	1 47	.....	48	7 27.0	24 43	8.6
Sat Oct 10/Sun Oct 11*	0 38	18 58	20 13	5 47	7 02	20 50	5 25	3 37	.....	38	8 23.4	23 11	8.6
Sun Oct 11/Mon Oct 12	23 41	19 58	21 13	5 46	7 01	20 54	5 28	4 24	.....	28	9 16.6	20 27	8.5
Mon Oct 12/Tue Oct 13	23 45	19 59	21 14	5 44	7 00	20 59	5 31	5 06	.....	19	10 12.2	16 29	8.5
Tue Oct 13/Wed Oct 14	23 49	20 00	21 15	5 43	6 58	21 04	5 33	5 46	.....	11	11 07.0	11 30	8.5
Wed Oct 14/Thu Oct 15	23 53	20 00	21 16	5 42	6 57	21 09	5 36	6 24	17 45	5	12 01.3	5 46	8.4
Thu Oct 15/Fri Oct 16	23 57	20 01	21 17	5 40	6 56	21 13	5 39	.....	18 54	1	12 55.6	- 0 24	8.4
Fri Oct 16/Sat Oct 17	0 01	20 02	21 18	5 39	6 55	21 18	5 41	.....	20 03	0	13 50.7	- 6 36	8.4
Sat Oct 17/Sun Oct 18	0 05	20 02	21 18	5 38	6 54	21 23	5 44	.....	21 14	3	14 47.3	-12 24	8.3
Sun Oct 18/Mon Oct 19	0 09	20 03	21 19	5 37	6 53	21 28	5 47	.....	22 25	8	15 45.7	-17 23	8.3
Mon Oct 19/Tue Oct 20	0 13	20 04	21 20	5 35	6 52	21 33	5 49	.....	23 36	15	16 45.8	-21 10	8.3
Tue Oct 20/Wed Oct 21	0 17	20 04	21 21	5 34	6 51	21 38	5 52	.....	0 43	24	17 46.8	-23 31	8.2
Wed Oct 21/Thu Oct 22	0 21	20 05	21 22	5 33	6 50	21 42	5 55	.....	1 44	34	18 47.5	-24 19	8.2
Thu Oct 22/Fri Oct 23	0 25	20 06	21 23	5 32	6 49	21 47	5 57	.....	2 38	45	19 46.4	-23 37	8.1
Fri Oct 23/Sat Oct 24	0 29	20 07	21 24	5 30	6 48	21 52	6 00	.....	3 24	55	20 42.5	-21 37	8.1
Sat Oct 24/Sun Oct 25	0 33	20 07	21 25	5 29	6 47	21 57	6 03	.....	4 04	65	21 35.3	-18 34	8.1
Sun Oct 25/Mon Oct 26	0 37	20 08	21 26	5 28	6 46	22 02	6 06	.....	4 39	75	22 25.0	-14 42	8.0
Mon Oct 26/Tue Oct 27	0 40	20 09	21 27	5 27	6 45	22 07	6 08	.....	5 11	83	23 11.9	-10 15	8.0
Tue Oct 27/Wed Oct 28	0 44	20 10	21 28	5 26	6 44	22 12	6 11	.....	5 40	89	23 57.0	- 5 26	8.0
Wed Oct 28/Thu Oct 29	0 48	20 10	21 29	5 25	6 43	22 17	6 14	17 30	6 08	94	0 40.9	- 0 26	7.9
Thu Oct 29/Fri Oct 30	0 52	20 11	21 30	5 23	6 42	22 22	6 17	18 23	6 37	98	1 24.6	4 34	7.9
Fri Oct 30/Sat Oct 31	0 56	20 12	21 31	5 22	6 41	22 27	6 20	19 15	.....	100	2 08.7	9 25	7.9
Sat Oct 31/Sun Nov 01	1 00	20 13	21 32	5 21	6 41	22 32	6 22	20 09	.....	100	2 54.0	13 57	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.

***** 2020 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
Sun Nov 01/Mon Nov 02	1 04	20 14	21 33	5 20	6 40	22 37	6 25	21 03	.....	98	3 41.0	17 57	7.8
Mon Nov 02/Tue Nov 03	1 08	20 14	21 34	5 19	6 39	22 42	6 28	21 58	.....	94	4 30.2	21 16	7.7
Tue Nov 03/Wed Nov 04	1 12	20 15	21 35	5 18	6 38	22 47	6 31	22 54	.....	89	5 21.7	23 41	7.7
Wed Nov 04/Thu Nov 05	1 16	20 16	21 36	5 17	6 37	22 52	6 34	23 49	.....	82	6 15.2	25 02	7.7
Thu Nov 05/Fri Nov 06	1 20	20 17	21 37	5 16	6 37	22 57	6 37	0 43	.....	74	7 10.0	25 11	7.6
Fri Nov 06/Sat Nov 07	1 24	20 18	21 38	5 15	6 36	23 02	6 40	1 33	.....	64	8 05.4	24 05	7.6
Sat Nov 07/Sun Nov 08	1 28	20 19	21 40	5 14	6 35	23 07	6 43	2 19	.....	54	9 00.5	21 44	7.6
Sun Nov 08/Mon Nov 09	1 32	20 19	21 41	5 13	6 35	23 12	6 46	3 02	.....	44	9 54.7	18 13	7.5
Mon Nov 09/Tue Nov 10	1 36	20 20	21 42	5 12	6 34	23 17	6 49	3 41	.....	33	10 48.1	13 41	7.5
Tue Nov 10/Wed Nov 11	1 40	20 21	21 43	5 11	6 33	23 22	6 52	4 18	.....	23	11 40.8	8 20	7.5
Wed Nov 11/Thu Nov 12	1 44	20 22	21 44	5 10	6 33	23 27	6 55	4 54	.....	14	12 33.4	2 25	7.4
Thu Nov 12/Fri Nov 13	1 48	20 23	21 45	5 10	6 32	23 32	6 58	5 31	17 38	7	13 26.9	- 3 44	7.4
Fri Nov 13/Sat Nov 14	1 51	20 24	21 46	5 09	6 31	23 37	7 01	6 10	18 47	2	14 22.1	- 9 44	7.4
Sat Nov 14/Sun Nov 15	1 55	20 24	21 47	5 08	6 31	23 42	7 04	.....	19 58	0	15 19.5	-15 10	7.3
Sun Nov 15/Mon Nov 16	1 59	20 25	21 49	5 07	6 30	23 48	7 07	.....	21 11	1	16 19.5	-19 36	7.3
Mon Nov 16/Tue Nov 17	2 03	20 26	21 50	5 07	6 30	23 53	7 11	.....	22 22	5	17 21.4	-22 40	7.3
Tue Nov 17/Wed Nov 18	2 07	20 27	21 51	5 06	6 30	23 58	7 14	.....	23 28	11	18 24.0	-24 09	7.3
Wed Nov 18/Thu Nov 19	2 11	20 28	21 52	5 05	6 29	0 03	7 17	.....	0 28	19	19 25.3	-24 01	7.2
Thu Nov 19/Fri Nov 20	2 15	20 29	21 53	5 05	6 29	0 08	7 20	.....	1 19	29	20 24.0	-22 26	7.2
Fri Nov 20/Sat Nov 21	2 19	20 30	21 54	5 04	6 28	0 13	7 24	.....	2 03	39	21 19.0	-19 38	7.2
Sat Nov 21/Sun Nov 22	2 23	20 31	21 55	5 03	6 28	0 18	7 27	.....	2 40	49	22 10.4	-15 56	7.1
Sun Nov 22/Mon Nov 23	2 27	20 31	21 56	5 03	6 28	0 23	7 31	.....	3 13	59	22 58.5	-11 35	7.1
Mon Nov 23/Tue Nov 24	2 31	20 32	21 58	5 02	6 27	0 28	7 34	.....	3 43	68	23 44.1	- 6 50	7.1
Tue Nov 24/Wed Nov 25	2 35	20 33	21 59	5 02	6 27	0 33	7 37	.....	4 12	77	0 28.2	- 1 52	7.1
Wed Nov 25/Thu Nov 26	2 39	20 34	22 00	5 01	6 27	0 38	7 41	.....	4 40	84	1 11.7	3 10	7.0
Thu Nov 26/Fri Nov 27	2 43	20 35	22 01	5 01	6 27	0 43	7 44	.....	5 09	91	1 55.4	8 06	7.0
Fri Nov 27/Sat Nov 28	2 47	20 36	22 02	5 00	6 27	0 48	7 48	18 03	5 39	95	2 40.3	12 46	7.0
Sat Nov 28/Sun Nov 29	2 51	20 37	22 03	5 00	6 26	0 53	7 52	18 57	6 12	99	3 27.0	16 59	7.0
Sun Nov 29/Mon Nov 30	2 55	20 37	22 04	5 00	6 26	0 58	7 55	19 52	.....	100	4 16.0	20 34	6.9
Mon Nov 30/Tue Dec 01	2 58	20 38	22 05	5 00	6 26	1 03	7 59	20 49	.....	99	5 07.5	23 19	6.9

***** 2020 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
Tue Dec 01/Wed Dec 02	3 02	20 39	22 06	4 59	6 26	1 08	8 03	21 45	.....	97	6 01.2	25 00	6.9
Wed Dec 02/Thu Dec 03	3 06	20 40	22 07	4 59	6 26	1 13	8 06	22 39	.....	93	6 56.6	25 29	6.9
Thu Dec 03/Fri Dec 04	3 10	20 41	22 08	4 59	6 26	1 18	8 10	23 31	.....	87	7 52.4	24 41	6.8
Fri Dec 04/Sat Dec 05	3 14	20 41	22 09	4 59	6 26	1 23	8 14	0 18	.....	79	8 47.8	22 38	6.8
Sat Dec 05/Sun Dec 06	3 18	20 42	22 10	4 59	6 26	1 28	8 18	1 01	.....	70	9 42.0	19 24	6.8
Sun Dec 06/Mon Dec 07	3 22	20 43	22 11	4 59	6 26	1 33	8 22	1 40	.....	59	10 34.7	15 09	6.8
Mon Dec 07/Tue Dec 08	3 26	20 44	22 12	4 59	6 27	1 37	8 26	2 17	.....	48	11 26.3	10 07	6.8
Tue Dec 08/Wed Dec 09	3 30	20 44	22 13	4 59	6 27	1 42	8 29	2 52	.....	37	12 17.3	4 30	6.8
Wed Dec 09/Thu Dec 10	3 34	20 45	22 13	4 59	6 27	1 47	8 33	3 27	.....	27	13 08.6	- 1 25	6.8
Thu Dec 10/Fri Dec 11	3 38	20 46	22 14	4 59	6 27	1 52	8 38	4 03	.....	17	14 01.2	- 7 20	6.7
Fri Dec 11/Sat Dec 12	3 42	20 47	22 15	4 59	6 27	1 57	8 42	4 43	17 34	9	14 56.0	-12 53	6.7
Sat Dec 12/Sun Dec 13	3 46	20 47	22 16	4 59	6 28	2 01	8 46	5 27	18 45	4	15 53.7	-17 42	6.7
Sun Dec 13/Mon Dec 14	3 50	20 48	22 17	4 59	6 28	2 06	8 50	6 17	19 56	0	16 54.1	-21 22	6.7
Mon Dec 14/Tue Dec 15	3 54	20 49	22 17	5 00	6 28	2 11	8 54	.....	21 05	0	17 56.6	-23 35	6.7
Tue Dec 15/Wed Dec 16	3 58	20 49	22 18	5 00	6 29	2 15	8 58	.....	22 09	3	18 59.2	-24 09	6.7
Wed Dec 16/Thu Dec 17	4 02	20 50	22 19	5 00	6 29	2 20	9 03	.....	23 06	8	20 00.2	-23 09	6.7
Thu Dec 17/Fri Dec 18	4 06	20 50	22 19	5 01	6 29	2 25	9 07	.....	23 55	14	20 57.9	-20 45	6.7
Fri Dec 18/Sat Dec 19	4 09	20 51	22 20	5 01	6 30	2 29	9 11	.....	0 36	23	21 51.7	-17 17	6.7
Sat Dec 19/Sun Dec 20	4 13	20 51	22 20	5 01	6 30	2 34	9 16	.....	1 12	32	22 41.8	-13 04	6.7
Sun Dec 20/Mon Dec 21	4 17	20 52	22 21	5 02	6 31	2 38	9 20	.....	1 44	41	23 28.8	- 8 22	6.7
Mon Dec 21/Tue Dec 22	4 21	20 52	22 21	5 02	6 31	2 42	9 24	.....	2 13	51	0 13.7	- 3 25	6.7
Tue Dec 22/Wed Dec 23	4 25	20 53	22 22	5 03	6 32	2 47	9 29	.....	2 42	60	0 57.4	1 38	6.7
Wed Dec 23/Thu Dec 24	4 29	20 53	22 22	5 04	6 32	2 51	9 34	.....	3 10	70	1 40.9	6 37	6.7
Thu Dec 24/Fri Dec 25	4 33	20 54	22 23	5 04	6 33	2 56	9 38	.....	3 40	78	2 25.2	11 22	6.7
Fri Dec 25/Sat Dec 26	4 37	20 54	22 23	5 05	6 34	3 00	9 43	.....	4 12	85	3 11.1	15 45	6.7
Sat Dec 26/Sun Dec 27	4 41	20 55	22 23	5 05	6 34	3 04	9 47	17 44	4 47	91	3 59.3	19 34	6.7
Sun Dec 27/Mon Dec 28	4 45	20 55	22 24	5 06	6 35	3 08	9 52	18 40	5 28	96	4 50.3	22 37	6.7
Mon Dec 28/Tue Dec 29	4 49	20 55	22 24	5 07	6 36	3 13	9 57	19 37	6 14	99	5 43.9	24 41	6.7
Tue Dec 29/Wed Dec 30	4 53	20 56	22 24	5 08	6 36	3 17	10 01	20 33	.....	100	6 39.7	25 34	6.7
Wed Dec 30/Thu Dec 31	4 57	20 56	22 24	5 08	6 37	3 21	10 06	21 26	.....	99	7 36.7	25 08	6.7
Thu Dec 31/Fri Jan 01	5 01	20 56	22 24	5 09	6 38	3 25	10 11	22 16	.....	96	8 33.5	23 22	6.7