

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:

\*\*\*\*\* 2024 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 hemishpheres. 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 2024, 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 12 20 32	Dec 19 15 40	Dec 26 21 34	Jan 04 0 33
Jan 11 8 58	Jan 18 0 54	Jan 25 14 55	Feb 02 20 20
Feb 09 20 01	Feb 16 12 02	Feb 24 9 31	Mar 03 12 25
Mar 10 5 03	Mar 17 0 12	Mar 25 3 02	Apr 01 23 16
Apr 08 14 23	Apr 15 15 14	Apr 23 19 51	May 01 7 28
May 07 23 24	May 15 7 50	May 23 9 56	May 30 13 14
Jun 06 8 40	Jun 14 1 20	Jun 21 21 11	Jun 28 17 55
Jul 05 18 59	Jul 13 18 50	Jul 21 6 20	Jul 27 22 54
Aug 04 7 14	Aug 12 11 20	Aug 19 14 29	Aug 26 5 29
Sep 02 21 57	Sep 11 2 07	Sep 17 22 37	Sep 24 14 53
Oct 02 14 51	Oct 10 14 56	Oct 17 8 28	Oct 24 5 05
Nov 01 9 48	Nov 09 2 57	Nov 15 18 30	Nov 22 22 30
Dec 01 3 22	Dec 08 12 28	Dec 15 6 03	Dec 22 19 20
Dec 30 19 28	Jan 06 20 58	Jan 13 19 28	Jan 21 17 32

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.

\*\*\*\*\* 2024 JANUARY \*\*\*\*\*

Date (eve/morn)			LMST	----- Sun: -----				LST twilight:		----- Moon: -----					Twi-Twi
			midn	set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec	hours
Mon	Jan 01/Tue	Jan 02	5 02	20 56	22 24	5 10	6 38	3 26	10 12	0 32	.....	68	11 27.9	7 07	6.8
Tue	Jan 02/Wed	Jan 03	5 06	20 56	22 24	5 10	6 39	3 30	10 17	0 58	.....	59	12 09.8	1 35	6.8
Wed	Jan 03/Thu	Jan 04	5 10	20 56	22 25	5 11	6 39	3 34	10 22	1 24	.....	50	12 51.8	- 4 01	6.8
Thu	Jan 04/Fri	Jan 05	5 14	20 57	22 25	5 12	6 40	3 38	10 27	1 51	.....	40	13 35.0	- 9 31	6.8
Fri	Jan 05/Sat	Jan 06	5 18	20 57	22 24	5 13	6 41	3 42	10 32	2 20	.....	31	14 20.7	-14 45	6.8
Sat	Jan 06/Sun	Jan 07	5 21	20 57	22 24	5 14	6 42	3 46	10 36	2 54	.....	22	15 09.8	-19 28	6.8
Sun	Jan 07/Mon	Jan 08	5 25	20 57	22 24	5 15	6 42	3 49	10 41	3 35	.....	14	16 03.3	-23 23	6.8
Mon	Jan 08/Tue	Jan 09	5 29	20 57	22 24	5 16	6 43	3 53	10 46	4 25	18 33	7	17 01.4	-26 07	6.9
Tue	Jan 09/Wed	Jan 10	5 33	20 57	22 24	5 17	6 44	3 57	10 51	5 24	19 39	3	18 03.4	-27 19	6.9
Wed	Jan 10/Thu	Jan 11	5 37	20 57	22 24	5 18	6 45	4 01	10 56	.....	20 42	0	19 07.4	-26 42	6.9
Thu	Jan 11/Fri	Jan 12	5 41	20 57	22 23	5 19	6 46	4 04	11 01	.....	21 37	1	20 10.9	-24 13	6.9
Fri	Jan 12/Sat	Jan 13	5 45	20 57	22 23	5 20	6 47	4 08	11 06	.....	22 25	4	21 12.0	-20 03	7.0
Sat	Jan 13/Sun	Jan 14	5 49	20 57	22 23	5 21	6 48	4 12	11 11	.....	23 05	9	22 09.5	-14 36	7.0
Sun	Jan 14/Mon	Jan 15	5 53	20 57	22 23	5 22	6 48	4 15	11 16	.....	23 41	17	23 03.7	- 8 17	7.0
Mon	Jan 15/Tue	Jan 16	5 57	20 56	22 22	5 24	6 49	4 19	11 21	.....	0 13	27	23 55.4	- 1 34	7.0
Tue	Jan 16/Wed	Jan 17	6 01	20 56	22 22	5 25	6 50	4 22	11 27	.....	0 45	38	0 45.8	5 10	7.1
Wed	Jan 17/Thu	Jan 18	6 05	20 56	22 21	5 26	6 51	4 26	11 32	.....	1 17	49	1 36.2	11 34	7.1
Thu	Jan 18/Fri	Jan 19	6 09	20 56	22 21	5 27	6 52	4 29	11 37	.....	1 51	60	2 27.7	17 20	7.1
Fri	Jan 19/Sat	Jan 20	6 13	20 55	22 20	5 28	6 53	4 33	11 42	.....	2 29	70	3 21.0	22 12	7.1
Sat	Jan 20/Sun	Jan 21	6 17	20 55	22 20	5 29	6 54	4 36	11 47	.....	3 12	79	4 16.6	25 53	7.2
Sun	Jan 21/Mon	Jan 22	6 21	20 55	22 19	5 30	6 55	4 39	11 52	17 42	4 00	87	5 14.0	28 12	7.2
Mon	Jan 22/Tue	Jan 23	6 25	20 54	22 18	5 32	6 56	4 43	11 57	18 41	4 54	93	6 12.1	29 01	7.2
Tue	Jan 23/Wed	Jan 24	6 29	20 54	22 18	5 33	6 56	4 46	12 02	19 34	5 51	97	7 09.5	28 18	7.3
Wed	Jan 24/Thu	Jan 25	6 32	20 54	22 17	5 34	6 57	4 49	12 07	20 21	.....	99	8 04.6	26 13	7.3
Thu	Jan 25/Fri	Jan 26	6 36	20 53	22 16	5 35	6 58	4 53	12 12	21 01	.....	100	8 56.6	22 56	7.3
Fri	Jan 26/Sat	Jan 27	6 40	20 53	22 16	5 36	6 59	4 56	12 18	21 36	.....	98	9 45.3	18 45	7.3
Sat	Jan 27/Sun	Jan 28	6 44	20 52	22 15	5 37	7 00	4 59	12 23	22 07	.....	95	10 31.0	13 54	7.4
Sun	Jan 28/Mon	Jan 29	6 48	20 52	22 14	5 39	7 01	5 02	12 28	22 34	.....	90	11 14.5	8 37	7.4
Mon	Jan 29/Tue	Jan 30	6 52	20 51	22 13	5 40	7 02	5 05	12 33	23 00	.....	83	11 56.7	3 04	7.4
Tue	Jan 30/Wed	Jan 31	6 56	20 51	22 12	5 41	7 03	5 08	12 38	23 25	.....	76	12 38.5	- 2 33	7.5
Wed	Jan 31/Thu	Feb 01	7 00	20 50	22 12	5 42	7 04	5 11	12 43	23 51	.....	67	13 21.0	- 8 05	7.5

\*\*\*\*\* 2024 FEBRUARY \*\*\*\*\*

Date (eve/morn)			LMST	----- Sun: -----				LST twilight:		----- Moon: -----					Twi-Twi
			midn	set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec	hours
Thu	Feb 01/Fri	Feb 02	7 04	20 49	22 11	5 43	7 05	5 14	12 48	0 19	.....	58	14 05.3	-13 22	7.5
Fri	Feb 02/Sat	Feb 03	7 08	20 49	22 10	5 44	7 06	5 17	12 53	0 50	.....	48	14 52.3	-18 12	7.6
Sat	Feb 03/Sun	Feb 04	7 12	20 48	22 09	5 46	7 06	5 20	12 58	1 27	.....	38	15 43.2	-22 20	7.6
Sun	Feb 04/Mon	Feb 05	7 16	20 47	22 08	5 47	7 07	5 23	13 04	2 11	.....	28	16 38.4	-25 27	7.6
Mon	Feb 05/Tue	Feb 06	7 20	20 47	22 07	5 48	7 08	5 26	13 09	3 04	.....	19	17 37.8	-27 14	7.7
Tue	Feb 06/Wed	Feb 07	7 24	20 46	22 06	5 49	7 09	5 29	13 14	4 07	18 22	11	18 40.3	-27 20	7.7
Wed	Feb 07/Thu	Feb 08	7 28	20 45	22 05	5 50	7 10	5 32	13 19	5 17	19 21	5	19 43.8	-25 35	7.8
Thu	Feb 08/Fri	Feb 09	7 32	20 44	22 04	5 51	7 11	5 35	13 24	6 32	20 12	1	20 46.2	-22 02	7.8
Fri	Feb 09/Sat	Feb 10	7 36	20 44	22 03	5 52	7 12	5 38	13 29	.....	20 56	0	21 45.9	-16 57	7.8
Sat	Feb 10/Sun	Feb 11	7 39	20 43	22 02	5 53	7 13	5 41	13 34	.....	21 35	2	22 42.5	-10 45	7.9
Sun	Feb 11/Mon	Feb 12	7 43	20 42	22 01	5 55	7 13	5 44	13 39	.....	22 10	7	23 36.4	- 3 54	7.9
Mon	Feb 12/Tue	Feb 13	7 47	20 41	22 00	5 56	7 14	5 47	13 44	.....	22 43	14	0 28.7	3 06	7.9
Tue	Feb 13/Wed	Feb 14	7 51	20 40	21 58	5 57	7 15	5 49	13 49	.....	23 16	23	1 20.4	9 52	8.0
Wed	Feb 14/Thu	Feb 15	7 55	20 39	21 57	5 58	7 16	5 52	13 54	.....	23 50	33	2 12.7	16 00	8.0
Thu	Feb 15/Fri	Feb 16	7 59	20 38	21 56	5 59	7 17	5 55	13 59	.....	0 28	44	3 06.4	21 14	8.0
Fri	Feb 16/Sat	Feb 17	8 03	20 37	21 55	6 00	7 17	5 58	14 04	.....	1 09	55	4 02.0	25 16	8.1
Sat	Feb 17/Sun	Feb 18	8 07	20 37	21 54	6 01	7 18	6 01	14 09	.....	1 57	65	4 59.1	27 55	8.1
Sun	Feb 18/Mon	Feb 19	8 11	20 36	21 53	6 02	7 19	6 03	14 14	.....	2 49	74	5 57.0	29 05	8.2
Mon	Feb 19/Tue	Feb 20	8 15	20 35	21 52	6 03	7 20	6 06	14 19	17 31	3 45	83	6 54.3	28 44	8.2
Tue	Feb 20/Wed	Feb 21	8 19	20 34	21 50	6 04	7 21	6 09	14 24	18 20	4 43	89	7 49.6	26 58	8.2
Wed	Feb 21/Thu	Feb 22	8 23	20 33	21 49	6 05	7 21	6 12	14 29	19 02	5 42	95	8 42.0	23 59	8.3
Thu	Feb 22/Fri	Feb 23	8 27	20 32	21 48	6 06	7 22	6 14	14 34	19 38	6 39	98	9 31.4	20 01	8.3
Fri	Feb 23/Sat	Feb 24	8 31	20 31	21 47	6 07	7 23	6 17	14 39	20 09	.....	100	10 17.8	15 17	8.3
Sat	Feb 24/Sun	Feb 25	8 35	20 29	21 45	6 08	7 24	6 20	14 43	20 37	.....	100	11 01.9	10 03	8.4
Sun	Feb 25/Mon	Feb 26	8 39	20 28	21 44	6 09	7 24	6 22	14 48	21 03	.....	98	11 44.6	4 29	8.4
Mon	Feb 26/Tue	Feb 27	8 43	20 27	21 43	6 10	7 25	6 25	14 53	21 28	.....	94	12 26.6	- 1 11	8.4
Tue	Feb 27/Wed	Feb 28	8 47	20 26	21 42	6 11	7 26	6 28	14 58	21 54	.....	89	13 09.0	- 6 49	8.5
Wed	Feb 28/Thu	Feb 29	8 50	20 25	21 40	6 11	7 27	6 30	15 03	22 20	.....	82	13 52.7	-12 13	8.5
Thu	Feb 29/Fri	Mar 01	8 54	20 24	21 39	6 12	7 27	6 33	15 08	22 50	.....	74	14 38.6	-17 12	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.

\*\*\*\*\* 2024 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
Fri Mar 01/Sat Mar 02	8 58	20 23	21 38	6 13	7 28	6 36	15 13	23 24	.....	65	15 27.8	-21 31	8.6
Sat Mar 02/Sun Mar 03	9 02	20 22	21 37	6 14	7 29	6 38	15 17	0 03	.....	55	16 20.7	-24 55	8.6
Sun Mar 03/Mon Mar 04	9 06	20 21	21 35	6 15	7 30	6 41	15 22	0 51	.....	44	17 17.4	-27 06	8.7
Mon Mar 04/Tue Mar 05	9 10	20 20	21 34	6 16	7 30	6 44	15 27	1 48	.....	34	18 17.4	-27 47	8.7
Tue Mar 05/Wed Mar 06	9 14	20 18	21 33	6 17	7 31	6 46	15 32	2 53	17 06	24	19 19.0	-26 45	8.7
Wed Mar 06/Thu Mar 07	9 18	20 17	21 31	6 17	7 32	6 49	15 36	4 04	17 59	15	20 20.5	-23 57	8.8
Thu Mar 07/Fri Mar 08	9 22	20 16	21 30	6 18	7 32	6 52	15 41	5 17	18 46	8	21 20.3	-19 31	8.8
Fri Mar 08/Sat Mar 09	9 26	20 15	21 29	6 19	7 33	6 54	15 46	6 30	19 26	2	22 17.6	-13 46	8.8
Sat Mar 09/Sun Mar 10*	9 30	20 14	21 28	5 20	6 34	6 57	15 51	.....	20 03	0	23 12.6	- 7 06	8.9
Sun Mar 10/Mon Mar 11	10 34	19 13	20 26	5 21	6 34	7 00	15 55	.....	19 37	1	0 09.1	0 19	8.9
Mon Mar 11/Tue Mar 12	10 38	19 11	20 25	5 21	6 35	7 02	16 00	.....	20 11	5	1 01.8	7 23	8.9
Tue Mar 12/Wed Mar 13	10 42	19 10	20 24	5 22	6 36	7 05	16 05	.....	20 45	11	1 55.1	13 58	9.0
Wed Mar 13/Thu Mar 14	10 46	19 09	20 22	5 23	6 36	7 08	16 10	.....	21 23	19	2 49.7	19 41	9.0
Thu Mar 14/Fri Mar 15	10 50	19 08	20 21	5 24	6 37	7 10	16 14	.....	22 04	29	3 46.1	24 13	9.0
Fri Mar 15/Sat Mar 16	10 54	19 07	20 20	5 24	6 38	7 13	16 19	.....	22 51	39	4 44.1	27 19	9.1
Sat Mar 16/Sun Mar 17	10 58	19 05	20 18	5 25	6 38	7 15	16 24	.....	23 42	49	5 42.6	28 53	9.1
Sun Mar 17/Mon Mar 18	11 02	19 04	20 17	5 26	6 39	7 18	16 28	.....	0 39	59	6 40.5	28 52	9.1
Mon Mar 18/Tue Mar 19	11 06	19 03	20 16	5 26	6 39	7 21	16 33	.....	1 37	69	7 36.4	27 25	9.2
Tue Mar 19/Wed Mar 20	11 09	19 02	20 15	5 27	6 40	7 23	16 37	.....	2 36	78	8 29.4	24 42	9.2
Wed Mar 20/Thu Mar 21	11 13	19 01	20 13	5 28	6 41	7 26	16 42	.....	3 33	85	9 19.1	20 57	9.2
Thu Mar 21/Fri Mar 22	11 17	18 59	20 12	5 28	6 41	7 29	16 47	17 12	4 29	91	10 06.0	16 24	9.3
Fri Mar 22/Sat Mar 23	11 21	18 58	20 11	5 29	6 42	7 31	16 51	17 41	5 23	96	10 50.5	11 15	9.3
Sat Mar 23/Sun Mar 24	11 25	18 57	20 10	5 30	6 43	7 34	16 56	18 07	6 16	99	11 33.4	5 44	9.3
Sun Mar 24/Mon Mar 25	11 29	18 56	20 08	5 30	6 43	7 37	17 01	18 33	7 09	100	12 15.7	0 00	9.4
Mon Mar 25/Tue Mar 26	11 33	18 54	20 07	5 31	6 44	7 40	17 05	18 58	.....	99	12 58.3	- 5 44	9.4
Tue Mar 26/Wed Mar 27	11 37	18 53	20 06	5 32	6 44	7 42	17 10	19 24	.....	97	13 42.1	-11 17	9.4
Wed Mar 27/Thu Mar 28	11 41	18 52	20 05	5 32	6 45	7 45	17 14	19 52	.....	92	14 28.0	-16 27	9.5
Thu Mar 28/Fri Mar 29	11 45	18 51	20 03	5 33	6 46	7 48	17 19	20 25	.....	86	15 16.8	-20 59	9.5
Fri Mar 29/Sat Mar 30	11 49	18 50	20 02	5 34	6 46	7 50	17 23	21 02	.....	79	16 09.1	-24 37	9.5
Sat Mar 30/Sun Mar 31	11 53	18 48	20 01	5 34	6 47	7 53	17 28	21 46	.....	70	17 04.9	-27 05	9.6
Sun Mar 31/Mon Apr 01	11 57	18 47	20 00	5 35	6 47	7 56	17 33	22 38	.....	60	18 03.6	-28 06	9.6

\*\*\*\*\* 2024 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
Mon Apr 01/Tue Apr 02	12 01	18 46	19 58	5 35	6 48	7 59	17 37	23 39	.....	49	19 03.8	-27 30	9.6
Tue Apr 02/Wed Apr 03	12 05	18 45	19 57	5 36	6 49	8 01	17 42	0 45	.....	38	20 04.0	-25 13	9.6
Wed Apr 03/Thu Apr 04	12 09	18 44	19 56	5 37	6 49	8 04	17 46	1 55	.....	27	21 02.7	-21 21	9.7
Thu Apr 04/Fri Apr 05	12 13	18 42	19 55	5 37	6 50	8 07	17 51	3 06	.....	18	21 59.1	-16 08	9.7
Fri Apr 05/Sat Apr 06	12 16	18 41	19 54	5 38	6 50	8 10	17 55	4 17	16 57	10	22 53.5	- 9 52	9.7
Sat Apr 06/Sun Apr 07	12 20	18 40	19 53	5 38	6 51	8 12	18 00	5 26	17 31	4	23 46.4	- 2 59	9.8
Sun Apr 07/Mon Apr 08	12 24	18 39	19 52	5 39	6 52	8 15	18 04	6 35	18 04	1	0 38.8	4 08	9.8
Mon Apr 08/Tue Apr 09	12 28	18 38	19 50	5 39	6 52	8 18	18 09	.....	18 38	0	1 31.9	11 00	9.8
Tue Apr 09/Wed Apr 10	12 32	18 37	19 49	5 40	6 53	8 21	18 13	.....	19 14	3	2 26.6	17 14	9.8
Wed Apr 10/Thu Apr 11	12 36	18 36	19 48	5 41	6 53	8 24	18 18	.....	19 55	8	3 23.4	22 24	9.9
Thu Apr 11/Fri Apr 12	12 40	18 34	19 47	5 41	6 54	8 27	18 22	.....	20 40	15	4 22.2	26 10	9.9
Fri Apr 12/Sat Apr 13	12 44	18 33	19 46	5 42	6 55	8 29	18 27	.....	21 32	24	5 22.1	28 21	9.9
Sat Apr 13/Sun Apr 14	12 48	18 32	19 45	5 42	6 55	8 32	18 31	.....	22 28	33	6 21.6	28 53	10.0
Sun Apr 14/Mon Apr 15	12 52	18 31	19 44	5 43	6 56	8 35	18 36	.....	23 27	43	7 19.2	27 52	10.0
Mon Apr 15/Tue Apr 16	12 56	18 30	19 43	5 43	6 56	8 38	18 40	.....	0 27	53	8 13.7	25 29	10.0
Tue Apr 16/Wed Apr 17	13 00	18 29	19 42	5 44	6 57	8 41	18 45	.....	1 26	63	9 04.7	21 59	10.0
Wed Apr 17/Thu Apr 18	13 04	18 28	19 41	5 44	6 58	8 44	18 49	.....	2 22	72	9 52.3	17 38	10.1
Thu Apr 18/Fri Apr 19	13 08	18 27	19 40	5 45	6 58	8 47	18 54	.....	3 17	80	10 37.3	12 40	10.1
Fri Apr 19/Sat Apr 20	13 12	18 26	19 39	5 46	6 59	8 50	18 58	.....	4 10	87	11 20.5	7 15	10.1
Sat Apr 20/Sun Apr 21	13 16	18 25	19 38	5 46	6 59	8 53	19 03	16 36	5 03	93	12 02.8	1 34	10.1
Sun Apr 21/Mon Apr 22	13 20	18 24	19 37	5 47	7 00	8 56	19 07	17 02	5 56	97	12 45.3	- 4 11	10.2
Mon Apr 22/Tue Apr 23	13 24	18 23	19 36	5 47	7 01	8 59	19 12	17 27	6 51	99	13 28.9	- 9 51	10.2
Tue Apr 23/Wed Apr 24	13 27	18 22	19 35	5 48	7 01	9 02	19 16	17 55	7 48	100	14 14.5	-15 11	10.2
Wed Apr 24/Thu Apr 25	13 31	18 21	19 34	5 48	7 02	9 05	19 21	18 26	.....	99	15 03.1	-19 59	10.2
Thu Apr 25/Fri Apr 26	13 35	18 20	19 34	5 49	7 02	9 08	19 25	19 02	.....	95	15 55.2	-23 56	10.3
Fri Apr 26/Sat Apr 27	13 39	18 19	19 33	5 49	7 03	9 11	19 30	19 45	.....	90	16 50.8	-26 45	10.3
Sat Apr 27/Sun Apr 28	13 43	18 18	19 32	5 50	7 04	9 14	19 34	20 34	.....	83	17 49.4	-28 08	10.3
Sun Apr 28/Mon Apr 29	13 47	18 17	19 31	5 50	7 04	9 18	19 39	21 32	.....	74	18 49.5	-27 56	10.3
Mon Apr 29/Tue Apr 30	13 51	18 16	19 30	5 51	7 05	9 21	19 43	22 36	.....	64	19 49.4	-26 04	10.3
Tue Apr 30/Wed May 01	13 55	18 16	19 30	5 51	7 06	9 24	19 47	23 44	.....	53	20 47.6	-22 38	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.

\*\*\*\*\* 2024 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
Wed May 01/Thu May 02	13 59	18 15	19 29	5 52	7 06	9 27	19 52	0 52	.....	41	21 43.4	-17 52	10.4
Thu May 02/Fri May 03	14 03	18 14	19 28	5 52	7 07	9 30	19 56	2 00	.....	30	22 36.8	-12 03	10.4
Fri May 03/Sat May 04	14 07	18 13	19 27	5 53	7 07	9 33	20 01	3 07	.....	20	23 28.6	- 5 32	10.4
Sat May 04/Sun May 05	14 11	18 12	19 27	5 54	7 08	9 37	20 05	4 14	.....	12	0 19.6	1 21	10.4
Sun May 05/Mon May 06	14 15	18 11	19 26	5 54	7 09	9 40	20 10	5 22	16 33	5	1 11.2	8 12	10.5
Mon May 06/Tue May 07	14 19	18 11	19 25	5 55	7 09	9 43	20 14	6 31	17 08	1	2 04.3	14 37	10.5
Tue May 07/Wed May 08	14 23	18 10	19 25	5 55	7 10	9 47	20 19	7 42	17 45	0	2 59.9	20 13	10.5
Wed May 08/Thu May 09	14 27	18 09	19 24	5 56	7 11	9 50	20 23	.....	18 28	1	3 58.1	24 35	10.5
Thu May 09/Fri May 10	14 31	18 09	19 23	5 56	7 11	9 53	20 28	.....	19 18	5	4 58.3	27 27	10.5
Fri May 10/Sat May 11	14 34	18 08	19 23	5 57	7 12	9 57	20 32	.....	20 13	11	5 59.1	28 38	10.6
Sat May 11/Sun May 12	14 38	18 07	19 22	5 57	7 12	10 00	20 37	.....	21 13	19	6 58.5	28 09	10.6
Sun May 12/Mon May 13	14 42	18 07	19 22	5 58	7 13	10 03	20 41	.....	22 14	27	7 55.0	26 11	10.6
Mon May 13/Tue May 14	14 46	18 06	19 21	5 58	7 14	10 07	20 45	.....	23 15	37	8 47.8	22 59	10.6
Tue May 14/Wed May 15	14 50	18 05	19 21	5 59	7 14	10 10	20 50	.....	0 13	46	9 36.8	18 52	10.6
Wed May 15/Thu May 16	14 54	18 05	19 20	5 59	7 15	10 14	20 54	.....	1 09	56	10 22.7	14 04	10.6
Thu May 16/Fri May 17	14 58	18 04	19 20	6 00	7 16	10 17	20 59	.....	2 03	65	11 06.3	8 47	10.7
Fri May 17/Sat May 18	15 02	18 04	19 19	6 00	7 16	10 21	21 03	.....	2 55	74	11 48.7	3 12	10.7
Sat May 18/Sun May 19	15 06	18 03	19 19	6 01	7 17	10 24	21 08	.....	3 48	82	12 30.9	- 2 30	10.7
Sun May 19/Mon May 20	15 10	18 03	19 19	6 01	7 17	10 28	21 12	.....	4 43	89	13 14.0	- 8 11	10.7
Mon May 20/Tue May 21	15 14	18 02	19 18	6 02	7 18	10 31	21 17	15 57	5 39	94	13 59.0	-13 39	10.7
Tue May 21/Wed May 22	15 18	18 02	19 18	6 02	7 18	10 35	21 21	16 27	6 38	98	14 46.9	-18 39	10.7
Wed May 22/Thu May 23	15 22	18 01	19 18	6 03	7 19	10 39	21 25	17 01	7 40	100	15 38.4	-22 56	10.8
Thu May 23/Fri May 24	15 26	18 01	19 17	6 03	7 20	10 42	21 30	17 42	.....	99	16 34.0	-26 08	10.8
Fri May 24/Sat May 25	15 30	18 01	19 17	6 04	7 20	10 46	21 34	18 30	.....	97	17 33.0	-27 58	10.8
Sat May 25/Sun May 26	15 34	18 00	19 17	6 04	7 21	10 50	21 39	19 26	.....	92	18 34.0	-28 10	10.8
Sun May 26/Mon May 27	15 38	18 00	19 16	6 05	7 21	10 53	21 43	20 29	.....	85	19 35.1	-26 40	10.8
Mon May 27/Tue May 28	15 42	18 00	19 16	6 05	7 22	10 57	21 48	21 36	.....	77	20 34.5	-23 32	10.8
Tue May 28/Wed May 29	15 45	17 59	19 16	6 05	7 22	11 01	21 52	22 44	.....	66	21 31.0	-19 01	10.8
Wed May 29/Thu May 30	15 49	17 59	19 16	6 06	7 23	11 05	21 56	23 52	.....	55	22 24.6	-13 27	10.8
Thu May 30/Fri May 31	15 53	17 59	19 16	6 06	7 23	11 08	22 01	0 58	.....	44	23 15.9	- 7 09	10.8
Fri May 31/Sat Jun 01	15 57	17 59	19 16	6 07	7 24	11 12	22 05	2 03	.....	33	0 06.0	- 0 29	10.9

\*\*\*\*\* 2024 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
Sat Jun 01/Sun Jun 02	16 01	17 58	19 15	6 07	7 24	11 16	22 09	3 08	.....	23	0 56.1	6 13	10.9
Sun Jun 02/Mon Jun 03	16 05	17 58	19 15	6 08	7 25	11 20	22 14	4 14	.....	14	1 47.4	12 37	10.9
Mon Jun 03/Tue Jun 04	16 09	17 58	19 15	6 08	7 25	11 24	22 18	5 22	.....	7	2 40.9	18 22	10.9
Tue Jun 04/Wed Jun 05	16 13	17 58	19 15	6 09	7 26	11 28	22 23	6 31	16 20	2	3 37.2	23 04	10.9
Wed Jun 05/Thu Jun 06	16 17	17 58	19 15	6 09	7 26	11 31	22 27	7 40	17 06	0	4 36.1	26 26	10.9
Thu Jun 06/Fri Jun 07	16 21	17 58	19 15	6 09	7 27	11 35	22 31	.....	17 58	1	5 36.6	28 11	10.9
Fri Jun 07/Sat Jun 08	16 25	17 58	19 15	6 10	7 27	11 39	22 36	.....	18 57	3	6 36.7	28 17	10.9
Sat Jun 08/Sun Jun 09	16 29	17 58	19 15	6 10	7 28	11 43	22 40	.....	19 58	8	7 34.7	26 47	10.9
Sun Jun 09/Mon Jun 10	16 33	17 58	19 15	6 10	7 28	11 47	22 44	.....	21 00	14	8 29.3	23 58	10.9
Mon Jun 10/Tue Jun 11	16 37	17 58	19 15	6 11	7 28	11 51	22 48	.....	22 01	22	9 19.9	20 05	10.9
Tue Jun 11/Wed Jun 12	16 41	17 58	19 15	6 11	7 29	11 55	22 53	.....	22 58	30	10 07.0	15 27	10.9
Wed Jun 12/Thu Jun 13	16 45	17 58	19 15	6 11	7 29	11 59	22 57	.....	23 53	39	10 51.4	10 18	10.9
Thu Jun 13/Fri Jun 14	16 49	17 58	19 16	6 12	7 30	12 03	23 01	.....	0 47	49	11 34.0	4 49	10.9
Fri Jun 14/Sat Jun 15	16 52	17 58	19 16	6 12	7 30	12 07	23 06	.....	1 39	58	12 15.9	- 0 49	10.9
Sat Jun 15/Sun Jun 16	16 56	17 58	19 16	6 12	7 30	12 11	23 10	.....	2 33	67	12 58.2	- 6 28	10.9
Sun Jun 16/Mon Jun 17	17 00	17 58	19 16	6 13	7 30	12 16	23 14	.....	3 28	76	13 42.1	-11 57	10.9
Mon Jun 17/Tue Jun 18	17 04	17 58	19 16	6 13	7 31	12 20	23 18	.....	4 26	84	14 28.6	-17 06	10.9
Tue Jun 18/Wed Jun 19	17 08	17 58	19 16	6 13	7 31	12 24	23 22	.....	5 27	91	15 18.8	-21 37	10.9
Wed Jun 19/Thu Jun 20	17 12	17 59	19 16	6 13	7 31	12 28	23 27	.....	6 30	96	16 13.1	-25 14	10.9
Thu Jun 20/Fri Jun 21	17 16	17 59	19 17	6 14	7 31	12 32	23 31	16 21	7 33	99	17 11.7	-27 34	10.9
Fri Jun 21/Sat Jun 22	17 20	17 59	19 17	6 14	7 32	12 36	23 35	17 16	.....	100	18 13.3	-28 19	10.9
Sat Jun 22/Sun Jun 23	17 24	17 59	19 17	6 14	7 32	12 40	23 39	18 18	.....	98	19 16.1	-27 17	10.9
Sun Jun 23/Mon Jun 24	17 28	18 00	19 17	6 14	7 32	12 45	23 43	19 25	.....	94	20 17.6	-24 31	10.9
Mon Jun 24/Tue Jun 25	17 32	18 00	19 18	6 14	7 32	12 49	23 47	20 35	.....	88	21 16.4	-20 12	10.9
Tue Jun 25/Wed Jun 26	17 36	18 00	19 18	6 14	7 32	12 53	23 51	21 44	.....	79	22 11.8	-14 43	10.9
Wed Jun 26/Thu Jun 27	17 40	18 00	19 18	6 14	7 32	12 57	23 55	22 51	.....	69	23 04.3	- 8 27	10.9
Thu Jun 27/Fri Jun 28	17 44	18 01	19 19	6 15	7 32	13 02	23 59	23 56	.....	58	23 54.9	- 1 48	10.9
Fri Jun 28/Sat Jun 29	17 48	18 01	19 19	6 15	7 32	13 06	0 03	1 00	.....	46	0 44.8	4 55	10.9
Sat Jun 29/Sun Jun 30	17 52	18 01	19 19	6 15	7 32	13 10	0 07	2 05	.....	35	1 35.2	11 20	10.9
Sun Jun 30/Mon Jul 01	17 56	18 02	19 20	6 15	7 32	13 14	0 11	3 11	.....	25	2 27.3	17 08	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.

\*\*\*\*\* 2024 JULY \*\*\*\*\*

Date (eve/morn)			LMST	----- Sun: -----				LST twilight:		----- Moon: -----				Twi-Twi	
			midn	set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec	hours
Mon Jul 01/Tue Jul 02	18 00	18 02 19 20	6 15 7 32	13 19	0 15	4 19	.....	16	3 21.9	22 01	10.9				
Tue Jul 02/Wed Jul 03	18 03	18 03 19 20	6 15 7 32	13 23	0 19	5 26	.....	9	4 19.1	25 40	10.9				
Wed Jul 03/Thu Jul 04	18 07	18 03 19 21	6 15 7 32	13 27	0 23	6 30	15 49	4	5 18.2	27 50	10.9				
Thu Jul 04/Fri Jul 05	18 11	18 03 19 21	6 15 7 32	13 32	0 27	7 29	16 44	1	6 17.9	28 22	10.9				
Fri Jul 05/Sat Jul 06	18 15	18 04 19 21	6 15 7 32	13 36	0 31	.....	17 44	0	7 16.2	27 20	10.9				
Sat Jul 06/Sun Jul 07	18 19	18 04 19 22	6 15 7 32	13 40	0 35	.....	18 46	2	8 11.6	24 52	10.9				
Sun Jul 07/Mon Jul 08	18 23	18 05 19 22	6 15 7 32	13 45	0 39	.....	19 48	5	9 03.4	21 17	10.9				
Mon Jul 08/Tue Jul 09	18 27	18 05 19 23	6 14 7 32	13 49	0 43	.....	20 47	10	9 51.6	16 50	10.9				
Tue Jul 09/Wed Jul 10	18 31	18 06 19 23	6 14 7 31	13 53	0 46	.....	21 43	17	10 36.8	11 48	10.9				
Wed Jul 10/Thu Jul 11	18 35	18 06 19 23	6 14 7 31	13 58	0 50	.....	22 38	24	11 19.8	6 24	10.8				
Thu Jul 11/Fri Jul 12	18 39	18 07 19 24	6 14 7 31	14 02	0 54	.....	23 31	33	12 01.6	0 49	10.8				
Fri Jul 12/Sat Jul 13	18 43	18 07 19 24	6 14 7 31	14 06	0 58	.....	0 23	42	12 43.3	- 4 48	10.8				
Sat Jul 13/Sun Jul 14	18 47	18 08 19 25	6 14 7 30	14 11	1 01	.....	1 17	51	13 26.0	-10 18	10.8				
Sun Jul 14/Mon Jul 15	18 51	18 08 19 25	6 13 7 30	14 15	1 05	.....	2 13	61	14 10.8	-15 29	10.8				
Mon Jul 15/Tue Jul 16	18 55	18 09 19 25	6 13 7 30	14 19	1 09	.....	3 12	70	14 58.8	-20 11	10.8				
Tue Jul 16/Wed Jul 17	18 59	18 09 19 26	6 13 7 29	14 24	1 13	.....	4 14	79	15 50.9	-24 06	10.8				
Wed Jul 17/Thu Jul 18	19 03	18 10 19 26	6 13 7 29	14 28	1 16	.....	5 17	87	16 47.4	-26 55	10.8				
Thu Jul 18/Fri Jul 19	19 07	18 10 19 27	6 12 7 29	14 33	1 20	.....	6 19	93	17 47.9	-28 17	10.8				
Fri Jul 19/Sat Jul 20	19 10	18 11 19 27	6 12 7 28	14 37	1 23	16 01	7 16	98	18 50.9	-27 56	10.7				
Sat Jul 20/Sun Jul 21	19 14	18 11 19 28	6 12 7 28	14 41	1 27	17 07	8 08	100	19 54.1	-25 44	10.7				
Sun Jul 21/Mon Jul 22	19 18	18 12 19 28	6 11 7 27	14 46	1 31	18 18	.....	99	20 55.4	-21 49	10.7				
Mon Jul 22/Tue Jul 23	19 22	18 13 19 29	6 11 7 27	14 50	1 34	19 29	.....	96	21 53.6	-16 29	10.7				
Tue Jul 23/Wed Jul 24	19 26	18 13 19 29	6 10 7 26	14 55	1 38	20 39	.....	89	22 48.6	-10 11	10.7				
Wed Jul 24/Thu Jul 25	19 30	18 14 19 30	6 10 7 26	14 59	1 41	21 47	.....	81	23 41.2	- 3 22	10.7				
Thu Jul 25/Fri Jul 26	19 34	18 14 19 30	6 09 7 25	15 03	1 45	22 53	.....	71	0 32.4	3 34	10.7				
Fri Jul 26/Sat Jul 27	19 38	18 15 19 30	6 09 7 24	15 08	1 48	23 58	.....	60	1 23.6	10 13	10.6				
Sat Jul 27/Sun Jul 28	19 42	18 15 19 31	6 08 7 24	15 12	1 51	1 04	.....	49	2 15.8	16 14	10.6				
Sun Jul 28/Mon Jul 29	19 46	18 16 19 31	6 08 7 23	15 17	1 55	2 11	.....	38	3 10.0	21 20	10.6				
Mon Jul 29/Tue Jul 30	19 50	18 17 19 32	6 07 7 23	15 21	1 58	3 18	.....	27	4 06.3	25 13	10.6				
Tue Jul 30/Wed Jul 31	19 54	18 17 19 32	6 07 7 22	15 25	2 02	4 22	.....	18	5 04.6	27 40	10.6				
Wed Jul 31/Thu Aug 01	19 58	18 18 19 33	6 06 7 21	15 30	2 05	5 22	.....	11	6 03.5	28 32	10.6				

\*\*\*\*\* 2024 AUGUST \*\*\*\*\*

Date (eve/morn)			LMST	----- Sun: -----				LST twilight:		----- Moon: -----				Twi-Twi	
			midn	set	twi.end	twi.beg	rise	eve	morn	rise	set	%illum	RA	Dec	hours
Thu Aug 01/Fri Aug 02	20 02	18 18 19 33	6 06 7 20	15 34	2 08	6 15	.....	6	7 01.5	27 50	10.5				
Fri Aug 02/Sat Aug 03	20 06	18 19 19 34	6 05 7 20	15 39	2 12	7 01	16 36	2	7 57.1	25 43	10.5				
Sat Aug 03/Sun Aug 04	20 10	18 19 19 34	6 04 7 19	15 43	2 15	7 40	17 37	0	8 49.4	22 24	10.5				
Sun Aug 04/Mon Aug 05	20 14	18 20 19 35	6 04 7 18	15 48	2 18	.....	18 37	1	9 38.2	18 09	10.5				
Mon Aug 05/Tue Aug 06	20 17	18 21 19 35	6 03 7 17	15 52	2 21	.....	19 34	3	10 23.9	13 15	10.5				
Tue Aug 06/Wed Aug 07	20 21	18 21 19 36	6 02 7 16	15 56	2 25	.....	20 29	7	11 07.2	7 55	10.4				
Wed Aug 07/Thu Aug 08	20 25	18 22 19 36	6 01 7 16	16 01	2 28	.....	21 23	12	11 49.1	2 22	10.4				
Thu Aug 08/Fri Aug 09	20 29	18 22 19 37	6 01 7 15	16 05	2 31	.....	22 15	19	12 30.4	- 3 15	10.4				
Fri Aug 09/Sat Aug 10	20 33	18 23 19 37	6 00 7 14	16 10	2 34	.....	23 09	27	13 12.3	- 8 45	10.4				
Sat Aug 10/Sun Aug 11	20 37	18 23 19 38	5 59 7 13	16 14	2 37	.....	0 03	35	13 55.7	-13 59	10.4				
Sun Aug 11/Mon Aug 12	20 41	18 24 19 38	5 58 7 12	16 18	2 40	.....	1 00	45	14 41.6	-18 47	10.3				
Mon Aug 12/Tue Aug 13	20 45	18 25 19 39	5 57 7 11	16 23	2 43	.....	2 00	54	15 31.1	-22 54	10.3				
Tue Aug 13/Wed Aug 14	20 49	18 25 19 39	5 57 7 10	16 27	2 47	.....	3 01	64	16 24.6	-26 05	10.3				
Wed Aug 14/Thu Aug 15	20 53	18 26 19 39	5 56 7 09	16 32	2 50	.....	4 03	74	17 22.4	-28 00	10.3				
Thu Aug 15/Fri Aug 16	20 57	18 26 19 40	5 55 7 08	16 36	2 53	.....	5 02	83	18 23.5	-28 21	10.2				
Fri Aug 16/Sat Aug 17	21 01	18 27 19 40	5 54 7 07	16 41	2 56	.....	5 55	91	19 26.2	-26 55	10.2				
Sat Aug 17/Sun Aug 18	21 05	18 27 19 41	5 53 7 06	16 45	2 59	.....	6 43	96	20 28.4	-23 41	10.2				
Sun Aug 18/Mon Aug 19	21 09	18 28 19 41	5 52 7 05	16 49	3 02	17 07	7 24	99	21 28.5	-18 50	10.2				
Mon Aug 19/Tue Aug 20	21 13	18 29 19 42	5 51 7 04	16 54	3 05	18 19	.....	100	22 25.9	-12 43	10.2				
Tue Aug 20/Wed Aug 21	21 17	18 29 19 42	5 50 7 03	16 58	3 08	19 29	.....	97	23 20.9	- 5 49	10.1				
Wed Aug 21/Thu Aug 22	21 21	18 30 19 43	5 49 7 02	17 03	3 11	20 38	.....	91	0 14.3	1 25	10.1				
Thu Aug 22/Fri Aug 23	21 25	18 30 19 43	5 48 7 01	17 07	3 14	21 46	.....	83	1 07.3	8 29	10.1				
Fri Aug 23/Sat Aug 24	21 28	18 31 19 44	5 47 7 00	17 12	3 16	22 54	.....	74	2 01.0	14 58	10.1				
Sat Aug 24/Sun Aug 25	21 32	18 31 19 44	5 46 6 59	17 16	3 19	0 02	.....	63	2 56.2	20 30	10.0				
Sun Aug 25/Mon Aug 26	21 36	18 32 19 45	5 45 6 58	17 20	3 22	1 10	.....	52	3 53.4	24 46	10.0				
Mon Aug 26/Tue Aug 27	21 40	18 32 19 45	5 44 6 57	17 25	3 25	2 16	.....	41	4 52.1	27 34	10.0				
Tue Aug 27/Wed Aug 28	21 44	18 33 19 46	5 43 6 56	17 29	3 28	3 18	.....	31	5 51.3	28 45	10.0				
Wed Aug 28/Thu Aug 29	21 48	18 33 19 46	5 42 6 54	17 34	3 31	4 12	.....	22	6 49.6	28 21	9.9				
Thu Aug 29/Fri Aug 30	21 52	18 34 19 47	5 41 6 53	17 38	3 34	5 00	.....	14	7 45.4	26 30	9.9				
Fri Aug 30/Sat Aug 31	21 56	18 34 19 47	5 39 6 52	17 43	3 36	5 40	.....	8	8 38.0	23 25	9.9				
Sat Aug 31/Sun Sep 01	22 00	18 35 19 48	5 38 6 51	17 47	3 39	6 14	16 30	4	9 27.1	19 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.

\*\*\*\*\* 2024 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
Sun Sep 01/Mon Sep 02	22 04	18 36	19 48	5 37	6 50	17 51	3 42	6 45	17 27	1	10 13.1	14 36	9.8
Mon Sep 02/Tue Sep 03	22 08	18 36	19 49	5 36	6 49	17 56	3 45	7 12	18 23	0	10 56.7	9 22	9.8
Tue Sep 03/Wed Sep 04	22 12	18 37	19 49	5 35	6 47	18 00	3 48	.....	19 17	1	11 38.6	3 51	9.8
Wed Sep 04/Thu Sep 05	22 16	18 37	19 50	5 34	6 46	18 05	3 50	.....	20 09	4	12 19.8	- 1 46	9.7
Thu Sep 05/Fri Sep 06	22 20	18 38	19 50	5 32	6 45	18 09	3 53	.....	21 02	8	13 01.2	- 7 18	9.7
Fri Sep 06/Sat Sep 07	22 24	18 38	19 51	5 31	6 44	18 14	3 56	.....	21 56	14	13 43.8	-12 36	9.7
Sat Sep 07/Sun Sep 08	22 28	18 39	19 51	5 30	6 43	18 18	3 59	.....	22 52	21	14 28.4	-17 29	9.6
Sun Sep 08/Mon Sep 09	22 32	18 39	19 52	5 29	6 41	18 23	4 01	.....	23 50	29	15 15.9	-21 46	9.6
Mon Sep 09/Tue Sep 10	22 35	18 40	19 52	5 28	6 40	18 27	4 04	.....	0 49	38	16 06.9	-25 11	9.6
Tue Sep 10/Wed Sep 11	22 39	18 40	19 53	5 26	6 39	18 32	4 07	.....	1 50	48	17 01.7	-27 29	9.6
Wed Sep 11/Thu Sep 12	22 43	18 41	19 53	5 25	6 38	18 36	4 09	.....	2 48	59	17 59.9	-28 24	9.5
Thu Sep 12/Fri Sep 13	22 47	18 41	19 54	5 24	6 36	18 41	4 12	.....	3 43	69	19 00.2	-27 41	9.5
Fri Sep 13/Sat Sep 14	22 51	18 42	19 55	5 23	6 35	18 45	4 15	.....	4 32	79	20 01.0	-25 16	9.5
Sat Sep 14/Sun Sep 15	22 55	18 42	19 55	5 21	6 34	18 50	4 17	.....	5 16	88	21 00.9	-21 10	9.4
Sun Sep 15/Mon Sep 16	22 59	18 43	19 56	5 20	6 33	18 54	4 20	.....	5 54	94	21 58.8	-15 37	9.4
Mon Sep 16/Tue Sep 17	23 03	18 44	19 56	5 19	6 31	18 59	4 23	17 04	6 29	99	22 54.9	- 8 59	9.4
Tue Sep 17/Wed Sep 18	23 07	18 44	19 57	5 17	6 30	19 03	4 25	18 15	7 03	100	23 49.6	- 1 43	9.3
Wed Sep 18/Thu Sep 19	23 11	18 45	19 57	5 16	6 29	19 08	4 28	19 25	.....	98	0 44.0	5 41	9.3
Thu Sep 19/Fri Sep 20	23 15	18 45	19 58	5 15	6 28	19 12	4 31	20 35	.....	93	1 39.1	12 43	9.3
Fri Sep 20/Sat Sep 21	23 19	18 46	19 59	5 14	6 26	19 17	4 33	21 45	.....	86	2 35.9	18 54	9.2
Sat Sep 21/Sun Sep 22	23 23	18 46	19 59	5 12	6 25	19 21	4 36	22 56	.....	77	3 34.8	23 50	9.2
Sun Sep 22/Mon Sep 23	23 27	18 47	20 00	5 11	6 24	19 26	4 38	0 06	.....	67	4 35.3	27 13	9.2
Mon Sep 23/Tue Sep 24	23 31	18 47	20 00	5 10	6 23	19 30	4 41	1 11	.....	56	5 36.4	28 52	9.2
Tue Sep 24/Wed Sep 25	23 35	18 48	20 01	5 08	6 21	19 35	4 44	2 09	.....	45	6 36.4	28 50	9.1
Wed Sep 25/Thu Sep 26	23 39	18 49	20 02	5 07	6 20	19 40	4 46	2 59	.....	35	7 33.7	27 16	9.1
Thu Sep 26/Fri Sep 27	23 43	18 49	20 02	5 06	6 19	19 44	4 49	3 41	.....	26	8 27.4	24 23	9.1
Fri Sep 27/Sat Sep 28	23 46	18 50	20 03	5 04	6 18	19 49	4 52	4 17	.....	18	9 17.2	20 30	9.0
Sat Sep 28/Sun Sep 29	23 50	18 50	20 04	5 03	6 16	19 53	4 54	4 48	.....	11	10 03.7	15 52	9.0
Sun Sep 29/Mon Sep 30	23 54	18 51	20 04	5 02	6 15	19 58	4 57	5 16	.....	6	10 47.5	10 44	9.0
Mon Sep 30/Tue Oct 01	23 58	18 51	20 05	5 00	6 14	20 03	4 59	5 41	17 12	2	11 29.5	5 16	8.9

\*\*\*\*\* 2024 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
Tue Oct 01/Wed Oct 02	0 02	18 52	20 06	4 59	6 13	20 07	5 02	6 06	18 05	0	12 10.7	- 0 20	8.9
Wed Oct 02/Thu Oct 03	0 06	18 53	20 07	4 58	6 11	20 12	5 05	6 31	18 57	0	12 51.9	- 5 54	8.9
Thu Oct 03/Fri Oct 04	0 10	18 53	20 07	4 56	6 10	20 17	5 07	6 58	19 51	2	13 34.0	-11 16	8.8
Fri Oct 04/Sat Oct 05	0 14	18 54	20 08	4 55	6 09	20 21	5 10	.....	20 46	5	14 18.0	-16 15	8.8
Sat Oct 05/Sun Oct 06	0 18	18 54	20 09	4 54	6 08	20 26	5 12	.....	21 43	10	15 04.5	-20 40	8.7
Sun Oct 06/Mon Oct 07	0 22	18 55	20 09	4 52	6 07	20 31	5 15	.....	22 42	16	15 54.1	-24 17	8.7
Mon Oct 07/Tue Oct 08	0 26	18 56	20 10	4 51	6 05	20 35	5 18	.....	23 42	24	16 47.0	-26 51	8.7
Tue Oct 08/Wed Oct 09	0 30	18 56	20 11	4 50	6 04	20 40	5 20	.....	0 40	33	17 42.9	-28 08	8.6
Wed Oct 09/Thu Oct 10	0 34	18 57	20 12	4 48	6 03	20 45	5 23	.....	1 35	43	18 40.8	-27 56	8.6
Thu Oct 10/Fri Oct 11	0 38	18 58	20 13	4 47	6 02	20 50	5 25	.....	2 25	53	19 39.5	-26 09	8.6
Fri Oct 11/Sat Oct 12	0 42	18 58	20 13	4 46	6 01	20 54	5 28	.....	3 09	64	20 37.5	-22 47	8.5
Sat Oct 12/Sun Oct 13*	0 46	18 59	20 14	5 44	7 00	20 59	5 31	.....	4 48	75	21 34.0	-17 58	8.5
Sun Oct 13/Mon Oct 14	23 49	20 00	21 15	5 43	6 58	21 04	5 33	.....	5 23	84	22 27.6	-12 15	8.5
Mon Oct 14/Tue Oct 15	23 53	20 00	21 16	5 42	6 57	21 09	5 36	.....	5 57	92	23 21.7	- 5 24	8.4
Tue Oct 15/Wed Oct 16	23 57	20 01	21 17	5 40	6 56	21 14	5 39	17 58	6 30	97	0 15.5	1 56	8.4
Wed Oct 16/Thu Oct 17	0 01	20 02	21 18	5 39	6 55	21 18	5 41	19 08	.....	100	1 10.3	9 14	8.4
Thu Oct 17/Fri Oct 18	0 05	20 02	21 19	5 38	6 54	21 23	5 44	20 20	.....	99	2 07.1	16 01	8.3
Fri Oct 18/Sat Oct 19	0 09	20 03	21 19	5 37	6 53	21 28	5 47	21 33	.....	96	3 06.5	21 44	8.3
Sat Oct 19/Sun Oct 20	0 13	20 04	21 20	5 35	6 52	21 33	5 49	22 45	.....	89	4 08.4	26 00	8.3
Sun Oct 20/Mon Oct 21	0 17	20 04	21 21	5 34	6 51	21 38	5 52	23 55	.....	81	5 11.8	28 28	8.2
Mon Oct 21/Tue Oct 22	0 21	20 05	21 22	5 33	6 50	21 43	5 55	0 59	.....	72	6 14.6	29 05	8.2
Tue Oct 22/Wed Oct 23	0 25	20 06	21 23	5 32	6 49	21 48	5 57	1 54	.....	62	7 14.8	27 59	8.1
Wed Oct 23/Thu Oct 24	0 29	20 07	21 24	5 30	6 48	21 52	6 00	2 40	.....	52	8 11.0	25 27	8.1
Thu Oct 24/Fri Oct 25	0 33	20 07	21 25	5 29	6 47	21 57	6 03	3 18	.....	42	9 02.9	21 47	8.1
Fri Oct 25/Sat Oct 26	0 37	20 08	21 26	5 28	6 46	22 02	6 06	3 51	.....	32	9 50.7	17 18	8.0
Sat Oct 26/Sun Oct 27	0 41	20 09	21 27	5 27	6 45	22 07	6 08	4 19	.....	24	10 35.3	12 16	8.0
Sun Oct 27/Mon Oct 28	0 45	20 10	21 28	5 26	6 44	22 12	6 11	4 46	.....	16	11 17.8	6 53	8.0
Mon Oct 28/Tue Oct 29	0 49	20 10	21 29	5 25	6 43	22 17	6 14	5 11	.....	10	11 59.0	1 20	7.9
Tue Oct 29/Wed Oct 30	0 52	20 11	21 30	5 23	6 42	22 22	6 17	5 35	17 52	5	12 40.1	- 4 15	7.9
Wed Oct 30/Thu Oct 31	0 56	20 12	21 31	5 22	6 41	22 27	6 20	6 02	18 45	2	13 21.9	- 9 41	7.9
Thu Oct 31/Fri Nov 01	1 00	20 13	21 32	5 21	6 41	22 32	6 22	6 30	19 40	0	14 05.4	-14 48	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.

\*\*\*\*\* 2024 NOVEMBER \*\*\*\*\*

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 Nov 01/Sat Nov 02	1 04	20 14	21 33	5 20	6 40	22 37	6 25	.....	20 37	0	14 51.4	-19 24	7.8
Sat Nov 02/Sun Nov 03	1 08	20 14	21 34	5 19	6 39	22 42	6 28	.....	21 36	2	15 40.3	-23 15	7.7
Sun Nov 03/Mon Nov 04	1 12	20 15	21 35	5 18	6 38	22 47	6 31	.....	22 36	6	16 32.5	-26 07	7.7
Mon Nov 04/Tue Nov 05	1 16	20 16	21 36	5 17	6 37	22 52	6 34	.....	23 35	12	17 27.5	-27 45	7.7
Tue Nov 05/Wed Nov 06	1 20	20 17	21 37	5 16	6 37	22 57	6 37	.....	0 30	19	18 24.6	-27 58	7.6
Wed Nov 06/Thu Nov 07	1 24	20 18	21 39	5 15	6 36	23 02	6 40	.....	1 21	27	19 22.2	-26 38	7.6
Thu Nov 07/Fri Nov 08	1 28	20 19	21 40	5 14	6 35	23 07	6 43	.....	2 06	37	20 19.0	-23 49	7.6
Fri Nov 08/Sat Nov 09	1 32	20 19	21 41	5 13	6 34	23 12	6 46	.....	2 45	48	21 14.3	-19 36	7.5
Sat Nov 09/Sun Nov 10	1 36	20 20	21 42	5 12	6 34	23 17	6 49	.....	3 21	59	22 07.8	-14 12	7.5
Sun Nov 10/Mon Nov 11	1 40	20 21	21 43	5 11	6 33	23 22	6 52	.....	3 53	70	23 00.0	- 7 54	7.5
Mon Nov 11/Tue Nov 12	1 44	20 22	21 44	5 10	6 33	23 27	6 55	.....	4 25	80	23 51.9	- 1 00	7.4
Tue Nov 12/Wed Nov 13	1 48	20 23	21 45	5 10	6 32	23 32	6 58	.....	4 58	89	0 44.5	6 08	7.4
Wed Nov 13/Thu Nov 14	1 52	20 24	21 46	5 09	6 31	23 38	7 01	17 54	5 33	95	1 39.2	13 04	7.4
Thu Nov 14/Fri Nov 15	1 56	20 25	21 47	5 08	6 31	23 43	7 04	19 05	6 13	99	2 37.0	19 17	7.3
Fri Nov 15/Sat Nov 16	1 59	20 25	21 49	5 07	6 30	23 48	7 08	20 18	.....	100	3 38.2	24 18	7.3
Sat Nov 16/Sun Nov 17	2 03	20 26	21 50	5 07	6 30	23 53	7 11	21 31	.....	97	4 42.4	27 40	7.3
Sun Nov 17/Mon Nov 18	2 07	20 27	21 51	5 06	6 30	23 58	7 14	22 40	.....	93	5 47.6	29 07	7.2
Mon Nov 18/Tue Nov 19	2 11	20 28	21 52	5 05	6 29	0 03	7 17	23 40	.....	86	6 51.3	28 40	7.2
Tue Nov 19/Wed Nov 20	2 15	20 29	21 53	5 04	6 29	0 08	7 21	0 32	.....	77	7 51.2	26 32	7.2
Wed Nov 20/Thu Nov 21	2 19	20 30	21 54	5 04	6 28	0 13	7 24	1 15	.....	68	8 46.3	23 05	7.2
Thu Nov 21/Fri Nov 22	2 23	20 31	21 55	5 03	6 28	0 18	7 27	1 50	.....	59	9 36.6	18 43	7.1
Fri Nov 22/Sat Nov 23	2 27	20 31	21 56	5 03	6 28	0 23	7 31	2 21	.....	49	10 23.0	13 43	7.1
Sat Nov 23/Sun Nov 24	2 31	20 32	21 58	5 02	6 27	0 28	7 34	2 48	.....	39	11 06.6	8 21	7.1
Sun Nov 24/Mon Nov 25	2 35	20 33	21 59	5 02	6 27	0 33	7 38	3 13	.....	31	11 48.4	- 2 47	7.1
Mon Nov 25/Tue Nov 26	2 39	20 34	22 00	5 01	6 27	0 38	7 41	3 38	.....	22	12 29.5	- 2 47	7.0
Tue Nov 26/Wed Nov 27	2 43	20 35	22 01	5 01	6 27	0 43	7 45	4 04	.....	15	13 11.1	- 8 15	7.0
Wed Nov 27/Thu Nov 28	2 47	20 36	22 02	5 00	6 27	0 48	7 48	4 32	17 33	9	13 54.2	-13 26	7.0
Thu Nov 28/Fri Nov 29	2 51	20 37	22 03	5 00	6 26	0 53	7 52	5 02	18 29	4	14 39.5	-18 10	7.0
Fri Nov 29/Sat Nov 30	2 55	20 37	22 04	5 00	6 26	0 58	7 55	5 38	19 27	1	15 27.9	-22 13	6.9
Sat Nov 30/Sun Dec 01	2 59	20 38	22 05	5 00	6 26	1 03	7 59	6 20	20 27	0	16 19.6	-25 19	6.9

\*\*\*\*\* 2024 DECEMBER \*\*\*\*\*

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 Dec 01/Mon Dec 02	3 03	20 39	22 06	4 59	6 26	1 08	8 03	.....	21 28	1	17 14.5	-27 15	6.9
Mon Dec 02/Tue Dec 03	3 06	20 40	22 07	4 59	6 26	1 13	8 06	.....	22 25	3	18 11.5	-27 46	6.9
Tue Dec 03/Wed Dec 04	3 10	20 41	22 08	4 59	6 26	1 18	8 10	.....	23 18	8	19 09.3	-26 45	6.8
Wed Dec 04/Thu Dec 05	3 14	20 41	22 09	4 59	6 26	1 23	8 14	.....	0 05	15	20 06.3	-24 13	6.8
Thu Dec 05/Fri Dec 06	3 18	20 42	22 10	4 59	6 26	1 28	8 18	.....	0 46	23	21 01.4	-20 19	6.8
Fri Dec 06/Sat Dec 07	3 22	20 43	22 11	4 59	6 26	1 33	8 22	.....	1 22	33	21 54.3	-15 16	6.8
Sat Dec 07/Sun Dec 08	3 26	20 44	22 12	4 59	6 27	1 38	8 26	.....	1 54	44	22 45.4	- 9 20	6.8
Sun Dec 08/Mon Dec 09	3 30	20 44	22 13	4 59	6 27	1 42	8 30	.....	2 25	55	23 35.6	- 2 48	6.8
Mon Dec 09/Tue Dec 10	3 34	20 45	22 13	4 59	6 27	1 47	8 34	.....	2 56	66	0 25.9	4 01	6.8
Tue Dec 10/Wed Dec 11	3 38	20 46	22 14	4 59	6 27	1 52	8 38	.....	3 29	77	1 17.7	10 47	6.7
Wed Dec 11/Thu Dec 12	3 42	20 47	22 15	4 59	6 27	1 57	8 42	.....	4 05	86	2 12.3	17 05	6.7
Thu Dec 12/Fri Dec 13	3 46	20 47	22 16	4 59	6 28	2 01	8 46	17 55	4 47	93	3 10.6	22 28	6.7
Fri Dec 13/Sat Dec 14	3 50	20 48	22 17	4 59	6 28	2 06	8 50	19 06	5 37	98	4 12.7	26 30	6.7
Sat Dec 14/Sun Dec 15	3 54	20 49	22 17	5 00	6 28	2 11	8 54	20 17	.....	100	5 17.5	28 46	6.7
Sun Dec 15/Mon Dec 16	3 58	20 49	22 18	5 00	6 29	2 15	8 58	21 22	.....	99	6 22.6	29 07	6.7
Mon Dec 16/Tue Dec 17	4 02	20 50	22 19	5 00	6 29	2 20	9 03	22 19	.....	96	7 25.4	27 38	6.7
Tue Dec 17/Wed Dec 18	4 06	20 50	22 19	5 01	6 29	2 25	9 07	23 06	.....	90	8 24.0	24 35	6.7
Wed Dec 18/Thu Dec 19	4 10	20 51	22 20	5 01	6 30	2 29	9 11	23 46	.....	83	9 17.6	20 24	6.7
Thu Dec 19/Fri Dec 20	4 14	20 51	22 20	5 01	6 30	2 34	9 16	0 19	.....	75	10 06.6	15 27	6.7
Fri Dec 20/Sat Dec 21	4 17	20 52	22 21	5 02	6 31	2 38	9 20	0 48	.....	66	10 52.0	10 02	6.7
Sat Dec 21/Sun Dec 22	4 21	20 52	22 21	5 02	6 31	2 43	9 25	1 15	.....	57	11 35.0	4 25	6.7
Sun Dec 22/Mon Dec 23	4 25	20 53	22 22	5 03	6 32	2 47	9 29	1 40	.....	48	12 16.8	- 1 14	6.7
Mon Dec 23/Tue Dec 24	4 29	20 53	22 22	5 04	6 32	2 51	9 34	2 05	.....	39	12 58.4	- 6 46	6.7
Tue Dec 24/Wed Dec 25	4 33	20 54	22 23	5 04	6 33	2 56	9 38	2 32	.....	30	13 41.1	-12 02	6.7
Wed Dec 25/Thu Dec 26	4 37	20 54	22 23	5 05	6 34	3 00	9 43	3 01	.....	22	14 25.6	-16 53	6.7
Thu Dec 26/Fri Dec 27	4 41	20 55	22 23	5 05	6 34	3 04	9 47	3 35	.....	14	15 13.0	-21 07	6.7
Fri Dec 27/Sat Dec 28	4 45	20 55	22 24	5 06	6 35	3 08	9 52	4 14	18 15	8	16 03.8	-24 30	6.7
Sat Dec 28/Sun Dec 29	4 49	20 55	22 24	5 07	6 36	3 13	9 57	5 01	19 16	4	16 58.1	-26 45	6.7
Sun Dec 29/Mon Dec 30	4 53	20 56	22 24	5 08	6 36	3 17	10 01	5 56	20 16	1	17 55.0	-27 39	6.7
Mon Dec 30/Tue Dec 31	4 57	20 56	22 24	5 09	6 37	3 21	10 06	.....	21 11	0	18 53.4	-27 01	6.7
Tue Dec 31/Wed Jan 01	5 01	20 56	22 24	5 09	6 38	3 25	10 11	.....	22 01	2	19 51.5	-24 48	6.7