

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 OU Norman \*\*\*\*\*

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 using conventions for the USA; for 2007+, 2nd Sunday in March to first Sunday in November.

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 OU Norman

Times and dates are given in local time, zone = 6 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 17 32	Dec 19 12 40	Dec 26 18 34	Jan 03 21 33
Jan 11 5 58	Jan 17 21 54	Jan 25 11 55	Feb 02 17 20
Feb 09 17 01	Feb 16 9 02	Feb 24 6 31	Mar 03 9 25
Mar 10 4 03	Mar 16 23 12	Mar 25 2 02	Apr 01 22 16
Apr 08 13 23	Apr 15 14 14	Apr 23 18 51	May 01 6 28
May 07 22 24	May 15 6 50	May 23 8 56	May 30 12 14
Jun 06 7 40	Jun 14 0 20	Jun 21 20 11	Jun 28 16 55
Jul 05 17 59	Jul 13 17 50	Jul 21 5 20	Jul 27 21 54
Aug 04 6 14	Aug 12 10 20	Aug 19 13 29	Aug 26 4 29
Sep 02 20 57	Sep 11 1 07	Sep 17 21 37	Sep 24 13 53
Oct 02 13 51	Oct 10 13 56	Oct 17 6 28	Oct 24 3 05
Nov 01 7 48	Nov 08 23 57	Nov 15 15 30	Nov 22 19 30
Dec 01 0 22	Dec 08 9 28	Dec 15 3 03	Dec 22 16 20
Dec 30 16 28	Jan 06 17 58	Jan 13 16 28	Jan 21 14 32

Calendar for OU Norman, west longitude (h.m.s) = 6 29 47, latitude (d.m) = 35 12.2  
 Rise/set times in Central time ( 6 hr W), uncorrected for elevation, 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 midn	----- Sun: -----	LST twilight: -----	Moon: -----	Twilight	
		set twi.end twi.beg rise	eve morn rise set %illum RA Dec			hours
Mon Jan 01/Tue Jan 02	6 16	17 28 18 59	6 08 7 38	1 14 12 25	22 55	..... 67 11 33.0 5 30 11.1
Tue Jan 02/Wed Jan 03	6 20	17 29 19 00	6 08 7 39	1 19 12 29	23 51	..... 58 12 15.0 - 0 05 11.1
Wed Jan 03/Thu Jan 04	6 24	17 30 19 00	6 08 7 39	1 23 12 33	0 48	..... 48 12 57.2 - 5 42 11.1
Thu Jan 04/Fri Jan 05	6 28	17 31 19 01	6 08 7 39	1 28 12 37	1 46	..... 39 13 40.9 -11 12 11.1
Fri Jan 05/Sat Jan 06	6 32	17 32 19 02	6 09 7 39	1 33 12 41	2 47	..... 29 14 27.1 -16 23 11.1
Sat Jan 06/Sun Jan 07	6 35	17 32 19 03	6 09 7 39	1 37 12 45	3 52	..... 21 15 16.9 -21 01 11.1
Sun Jan 07/Mon Jan 08	6 39	17 33 19 03	6 09 7 39	1 42 12 49	4 59	..... 13 16 11.2 -24 48 11.1
Mon Jan 08/Tue Jan 09	6 43	17 34 19 04	6 09 7 39	1 47 12 53	6 08	..... 7 17 10.0 -27 20 11.1
Tue Jan 09/Wed Jan 10	6 47	17 35 19 05	6 09 7 39	1 51 12 57	7 12	15 34 2 18 12.5 -28 17 11.1
Wed Jan 10/Thu Jan 11	6 51	17 36 19 06	6 09 7 39	1 56 13 01	8 10	16 39 0 19 16.6 -27 26 11.1
Thu Jan 11/Fri Jan 12	6 55	17 37 19 07	6 09 7 38	2 01 13 05	.....	17 52 1 20 19.9 -24 43 11.0
Fri Jan 12/Sat Jan 13	6 59	17 38 19 07	6 09 7 38	2 06 13 09	.....	19 08 4 21 20.3 -20 24 11.0
Sat Jan 13/Sun Jan 14	7 03	17 39 19 08	6 09 7 38	2 11 13 13	.....	20 23 10 22 17.2 -14 50 11.0
Sun Jan 14/Mon Jan 15	7 07	17 40 19 09	6 09 7 38	2 15 13 17	.....	21 36 18 23 10.8 - 8 29 11.0
Mon Jan 15/Tue Jan 16	7 11	17 41 19 10	6 08 7 38	2 20 13 20	.....	22 47 28 0 02.1 - 1 46 11.0
Tue Jan 16/Wed Jan 17	7 15	17 42 19 11	6 08 7 37	2 25 13 24	.....	23 55 39 0 52.2 4 55 11.0
Wed Jan 17/Thu Jan 18	7 19	17 43 19 12	6 08 7 37	2 30 13 28	.....	1 03 50 1 42.5 11 15 10.9
Thu Jan 18/Fri Jan 19	7 23	17 44 19 12	6 08 7 37	2 34 13 32	.....	2 10 61 2 33.9 16 56 10.9
Fri Jan 19/Sat Jan 20	7 27	17 45 19 13	6 08 7 36	2 39 13 35	.....	3 18 71 3 27.3 21 41 10.9
Sat Jan 20/Sun Jan 21	7 31	17 46 19 14	6 07 7 36	2 44 13 39	.....	4 24 80 4 22.9 25 15 10.9
Sun Jan 21/Mon Jan 22	7 35	17 47 19 15	6 07 7 35	2 49 13 43	.....	5 27 88 5 20.3 27 25 10.9
Mon Jan 22/Tue Jan 23	7 39	17 48 19 16	6 07 7 35	2 54 13 46	.....	6 23 94 6 18.3 28 04 10.8
Tue Jan 23/Wed Jan 24	7 42	17 49 19 17	6 06 7 34	2 59 13 50	15 49	7 12 98 7 15.4 27 13 10.8
Wed Jan 24/Thu Jan 25	7 46	17 50 19 18	6 06 7 34	3 03 13 53	16 49	7 52 100 8 10.1 24 58 10.8
Thu Jan 25/Fri Jan 26	7 50	17 51 19 19	6 05 7 33	3 08 13 57	17 50	..... 100 9 01.8 21 35 10.8
Fri Jan 26/Sat Jan 27	7 54	17 52 19 19	6 05 7 33	3 13 14 00	18 51	..... 98 9 50.2 17 17 10.8
Sat Jan 27/Sun Jan 28	7 58	17 53 19 20	6 04 7 32	3 18 14 04	19 50	..... 94 10 35.8 12 21 10.7
Sun Jan 28/Mon Jan 29	8 02	17 54 19 21	6 04 7 31	3 23 14 07	20 47	..... 89 11 19.2 6 59 10.7
Mon Jan 29/Tue Jan 30	8 06	17 55 19 22	6 03 7 31	3 27 14 11	21 43	..... 82 12 01.4 1 24 10.7
Tue Jan 30/Wed Jan 31	8 10	17 56 19 23	6 03 7 30	3 32 14 14	22 38	..... 74 12 43.4 - 4 14 10.7
Wed Jan 31/Thu Feb 01	8 14	17 57 19 24	6 02 7 29	3 37 14 17	23 35	..... 66 13 26.2 - 9 46 10.6

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

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 Feb 01/Fri Feb 02	8 18	17 58 19 25	6 02 7 28	3 42 14 21	0 34	..... 56 14 10.9 -15 01 10.6
Fri Feb 02/Sat Feb 03	8 22	17 59 19 26	6 01 7 28	3 47 14 24	1 35	..... 46 14 58.6 -19 47 10.6
Sat Feb 03/Sun Feb 04	8 26	18 00 19 27	6 00 7 27	3 52 14 27	2 40	..... 37 15 50.2 -23 48 10.6
Sun Feb 04/Mon Feb 05	8 30	18 01 19 27	6 00 7 26	3 56 14 30	3 47	..... 27 16 46.2 -26 46 10.5
Mon Feb 05/Tue Feb 06	8 34	18 02 19 28	5 59 7 25	4 01 14 34	4 52	..... 18 17 46.3 -28 20 10.5
Tue Feb 06/Wed Feb 07	8 38	18 03 19 29	5 58 7 24	4 06 14 37	5 53	..... 10 18 49.3 -28 12 10.5
Wed Feb 07/Thu Feb 08	8 42	18 04 19 30	5 57 7 23	4 11 14 40	6 46	..... 4 19 52.9 -26 13 10.5
Thu Feb 08/Fri Feb 09	8 46	18 05 19 31	5 57 7 22	4 16 14 43	7 30	16 39 1 20 55.0 -22 28 10.4
Fri Feb 09/Sat Feb 10	8 50	18 06 19 32	5 56 7 21	4 21 14 46	.....	17 57 0 21 54.3 -17 15 10.4
Sat Feb 10/Sun Feb 11	8 53	18 07 19 33	5 55 7 20	4 25 14 49	.....	19 13 2 22 50.3 -10 58 10.4
Sun Feb 11/Mon Feb 12	8 57	18 08 19 34	5 54 7 19	4 30 14 52	.....	20 27 7 23 43.8 - 4 06 10.3
Mon Feb 12/Tue Feb 13	9 01	18 09 19 34	5 53 7 18	4 35 14 55	.....	21 39 15 0 35.8 2 53 10.3
Tue Feb 13/Wed Feb 14	9 05	18 10 19 35	5 52 7 17	4 40 14 58	.....	22 50 24 1 27.3 9 35 10.3
Wed Feb 14/Thu Feb 15	9 09	18 11 19 36	5 51 7 16	4 45 15 01	.....	0 00 34 2 19.6 15 38 10.2
Thu Feb 15/Fri Feb 16	9 13	18 12 19 37	5 50 7 15	4 50 15 04	.....	1 10 45 3 13.3 20 44 10.2
Fri Feb 16/Sat Feb 17	9 17	18 13 19 38	5 49 7 14	4 54 15 07	.....	2 17 56 4 08.8 24 38 10.2
Sat Feb 17/Sun Feb 18	9 21	18 14 19 39	5 48 7 13	4 59 15 10	.....	3 22 66 5 05.9 27 09 10.2
Sun Feb 18/Mon Feb 19	9 25	18 15 19 40	5 47 7 12	5 04 15 13	.....	4 20 75 6 03.5 28 08 10.1
Mon Feb 19/Tue Feb 20	9 29	18 16 19 41	5 46 7 11	5 09 15 16	.....	5 10 84 7 00.4 27 38 10.1
Tue Feb 20/Wed Feb 21	9 33	18 17 19 41	5 45 7 10	5 14 15 19	.....	5 53 90 7 55.3 25 43 10.1
Wed Feb 21/Thu Feb 22	9 37	18 18 19 42	5 44 7 08	5 18 15 22	.....	6 29 95 8 47.3 22 36 10.0
Thu Feb 22/Fri Feb 23	9 41	18 19 19 43	5 43 7 07	5 23 15 24	16 43	6 59 98 9 36.3 18 31 10.0
Fri Feb 23/Sat Feb 24	9 45	18 19 19 44	5 42 7 06	5 28 15 27	17 42	7 25 100 10 22.4 13 43 10.0
Sat Feb 24/Sun Feb 25	9 49	18 20 19 45	5 40 7 05	5 33 15 30	18 40	7 49 99 11 06.4 8 25 9.9
Sun Feb 25/Mon Feb 26	9 53	18 21 19 46	5 39 7 04	5 38 15 33	19 36	..... 97 11 49.0 2 49 9.9
Mon Feb 26/Tue Feb 27	9 57	18 22 19 47	5 38 7 02	5 43 15 36	20 32	..... 93 12 31.1 - 2 53 9.9
Tue Feb 27/Wed Feb 28	10 00	18 23 19 48	5 37 7 01	5 47 15 38	21 28	..... 88 13 13.7 - 8 30 9.8
Wed Feb 28/Thu Feb 29	10 04	18 24 19 48	5 36 7 00	5 52 15 41	22 26	..... 81 13 57.7 -13 52 9.8
Thu Feb 29/Fri Mar 01	10 08	18 25 19 49	5 34 6 59	5 57 15 44	23 26	..... 72 14 44.2 -18 47 9.8

Calendar for OU Norman, west longitude (h.m.s) = 6 29 47, latitude (d.m) = 35 12.2  
Rise/set times in Central time ( 6 hr W), uncorrected for elevation, 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: ----- set twi.end twi.beg rise	LST twilight: eve morn	----- Moon: ----- rise set %illum RA Dec	Twi-Twi hours
Fri Mar 01/Sat Mar 02	10 12	18 26 19 50 5 33 6 57	6 02 15 46	0 28 ..... 63 15 34.0 -23 01	9.7
Sat Mar 02/Sun Mar 03	10 16	18 27 19 51 5 32 6 56	6 07 15 49	1 32 ..... 53 16 27.6 -26 17	9.7
Sun Mar 03/Mon Mar 04	10 20	18 28 19 52 5 30 6 55	6 11 15 52	2 37 ..... 43 17 25.1 -28 17	9.6
Mon Mar 04/Tue Mar 05	10 24	18 29 19 53 5 29 6 53	6 16 15 54	3 38 ..... 33 18 25.6 -28 46	9.6
Tue Mar 05/Wed Mar 06	10 28	18 29 19 54 5 28 6 52	6 21 15 57	4 33 ..... 23 19 27.6 -27 31	9.6
Wed Mar 06/Thu Mar 07	10 32	18 30 19 55 5 26 6 51	6 26 15 59	5 20 ..... 14 20 29.1 -24 30	9.5
Thu Mar 07/Fri Mar 08	10 36	18 31 19 55 5 25 6 49	6 31 16 02	6 00 ..... 7 21 28.7 -19 54	9.5
Fri Mar 08/Sat Mar 09	10 40	18 32 19 56 5 24 6 48	6 36 16 05	6 35 16 43 2 22 25.8 -14 02	9.5
Sat Mar 09/Sun Mar 10*	10 44	18 33 19 57 6 22 7 47	6 40 16 07	8 06 17 59 0 23 20.5 - 7 18	9.4
Sun Mar 10/Mon Mar 11	9 48	19 34 20 58 6 21 7 45	6 45 16 10	..... 20 13 1 0 10.8 - 0 28	9.4
Mon Mar 11/Tue Mar 12	9 52	19 35 20 59 6 20 7 44	6 50 16 12	..... 21 27 5 1 03.6 6 37	9.3
Tue Mar 12/Wed Mar 13	9 56	19 35 21 00 6 18 7 42	6 55 16 15	..... 22 40 11 1 57.1 13 14	9.3
Wed Mar 13/Thu Mar 14	9 59	19 36 21 01 6 17 7 41	7 00 16 17	..... 23 53 19 2 52.0 18 57	9.3
Thu Mar 14/Fri Mar 15	10 03	19 37 21 02 6 15 7 40	7 04 16 20	..... 1 04 29 3 48.6 23 29	9.2
Fri Mar 15/Sat Mar 16	10 07	19 38 21 02 6 14 7 38	7 09 16 22	..... 2 12 39 4 46.7 26 34	9.2
Sat Mar 16/Sun Mar 17	10 11	19 39 21 03 6 12 7 37	7 14 16 25	..... 3 14 50 5 45.5 28 05	9.1
Sun Mar 17/Mon Mar 18	10 15	19 40 21 04 6 11 7 35	7 19 16 27	..... 4 08 60 6 43.5 28 01	9.1
Mon Mar 18/Tue Mar 19	10 19	19 40 21 05 6 09 7 34	7 24 16 30	..... 4 53 70 7 39.3 26 29	9.1
Tue Mar 19/Wed Mar 20	10 23	19 41 21 06 6 08 7 33	7 29 16 32	..... 5 31 78 8 32.2 23 41	9.0
Wed Mar 20/Thu Mar 21	10 27	19 42 21 07 6 06 7 31	7 34 16 34	..... 6 02 86 9 21.8 19 51	9.0
Thu Mar 21/Fri Mar 22	10 31	19 43 21 08 6 05 7 30	7 38 16 37	..... 6 30 92 10 08.5 15 15	8.9
Fri Mar 22/Sat Mar 23	10 35	19 44 21 09 6 03 7 28	7 43 16 39	17 33 6 54 96 10 52.9 10 04	8.9
Sat Mar 23/Sun Mar 24	10 39	19 44 21 10 6 02 7 27	7 48 16 42	18 30 7 17 99 11 35.8 4 31	8.9
Sun Mar 24/Mon Mar 25	10 43	19 45 21 11 6 00 7 26	7 53 16 44	19 26 ..... 100 12 18.0 - 1 13	8.8
Mon Mar 25/Tue Mar 26	10 47	19 46 21 12 5 59 7 24	7 58 16 46	20 22 ..... 99 13 00.6 - 6 56	8.8
Tue Mar 26/Wed Mar 27	10 51	19 47 21 13 5 57 7 23	8 03 16 49	21 20 ..... 96 13 44.4 -12 26	8.7
Wed Mar 27/Thu Mar 28	10 55	19 48 21 13 5 56 7 21	8 08 16 51	22 19 ..... 92 14 30.3 -17 33	8.7
Thu Mar 28/Fri Mar 29	10 59	19 48 21 14 5 54 7 20	8 13 16 54	23 21 ..... 86 15 19.1 -22 01	8.7
Fri Mar 29/Sat Mar 30	11 03	19 49 21 15 5 52 7 18	8 17 16 56	0 24 ..... 78 16 11.4 -25 35	8.6
Sat Mar 30/Sun Mar 31	11 06	19 50 21 16 5 51 7 17	8 22 16 58	1 28 ..... 69 17 07.1 -27 59	8.6
Sun Mar 31/Mon Apr 01	11 10	19 51 21 17 5 49 7 16	8 27 17 01	2 29 ..... 59 18 05.7 -28 56	8.5

\*\*\*\*\* 2024 APRIL \*\*\*\*\*

Date (eve/morn)	LMST midn	----- Sun: ----- set twi.end twi.beg rise	LST twilight: eve morn	----- Moon: ----- rise set %illum RA Dec	Twi-Twi hours
Mon Apr 01/Tue Apr 02	11 14	19 52 21 18 5 48 7 14	8 32 17 03	3 24 ..... 49 19 05.9 -28 17	8.5
Tue Apr 02/Wed Apr 03	11 18	19 53 21 19 5 46 7 13	8 37 17 05	4 13 ..... 38 20 05.9 -25 59	8.4
Wed Apr 03/Thu Apr 04	11 22	19 53 21 20 5 45 7 12	8 42 17 08	4 54 ..... 27 21 04.4 -22 07	8.4
Thu Apr 04/Fri Apr 05	11 26	19 54 21 21 5 43 7 10	8 47 17 10	5 30 ..... 18 22 00.7 -16 54	8.4
Fri Apr 05/Sat Apr 06	11 30	19 55 21 22 5 41 7 09	8 52 17 13	6 02 ..... 10 22 55.0 -10 39	8.3
Sat Apr 06/Sun Apr 07	11 34	19 56 21 23 5 40 7 07	8 57 17 15	6 32 17 46 4 23 47.9 - 3 46	8.3
Sun Apr 07/Mon Apr 08	11 38	19 57 21 24 5 38 7 06	9 02 17 17	7 01 18 59 1 0 40.4 3 21	8.2
Mon Apr 08/Tue Apr 09	11 42	19 57 21 25 5 37 7 05	9 07 17 20	..... 20 13 0 1 33.6 10 15	8.2
Tue Apr 09/Wed Apr 10	11 46	19 58 21 26 5 35 7 03	9 12 17 22	..... 21 27 3 2 28.4 16 29	8.1
Wed Apr 10/Thu Apr 11	11 50	19 59 21 27 5 34 7 02	9 17 17 24	..... 22 41 8 3 25.4 21 40	8.1
Thu Apr 11/Fri Apr 12	11 54	20 00 21 28 5 32 7 01	9 22 17 27	..... 23 54 15 4 24.5 25 26	8.1
Fri Apr 12/Sat Apr 13	11 58	20 01 21 30 5 31 6 59	9 27 17 29	..... 1 01 24 5 24.6 27 35	8.0
Sat Apr 13/Sun Apr 14	12 02	20 01 21 31 5 29 6 58	9 32 17 32	..... 2 00 33 6 24.3 28 04	8.0
Sun Apr 14/Mon Apr 15	12 06	20 02 21 32 5 27 6 57	9 37 17 34	..... 2 50 44 7 21.9 26 58	7.9
Mon Apr 15/Tue Apr 16	12 10	20 03 21 33 5 26 6 56	9 42 17 36	..... 3 31 54 8 16.4 24 30	7.9
Tue Apr 16/Wed Apr 17	12 14	20 04 21 34 5 24 6 54	9 47 17 39	..... 4 05 63 9 07.3 20 56	7.8
Wed Apr 17/Thu Apr 18	12 17	20 05 21 35 5 23 6 53	9 52 17 41	..... 4 33 72 9 54.8 16 31	7.8
Thu Apr 18/Fri Apr 19	12 21	20 05 21 36 5 21 6 52	9 57 17 44	..... 4 58 80 10 39.7 11 30	7.8
Fri Apr 19/Sat Apr 20	12 25	20 06 21 37 5 20 6 51	10 02 17 46	..... 5 21 87 11 22.9 6 03	7.7
Sat Apr 20/Sun Apr 21	12 29	20 07 21 38 5 18 6 49	10 07 17 48	17 19 5 44 93 12 05.2 0 21	7.7
Sun Apr 21/Mon Apr 22	12 33	20 08 21 39 5 17 6 48	10 12 17 51	18 15 6 06 97 12 47.7 - 5 24	7.6
Mon Apr 22/Tue Apr 23	12 37	20 09 21 40 5 15 6 47	10 17 17 53	19 12 6 30 99 13 31.3 -11 02	7.6
Tue Apr 23/Wed Apr 24	12 41	20 10 21 42 5 14 6 46	10 22 17 56	20 11 ..... 100 14 17.1 -16 20	7.5
Wed Apr 24/Thu Apr 25	12 45	20 10 21 43 5 12 6 45	10 27 17 58	21 13 ..... 98 15 05.7 -21 04	7.5
Thu Apr 25/Fri Apr 26	12 49	20 11 21 44 5 11 6 43	10 33 18 01	22 17 ..... 95 15 57.8 -24 56	7.4
Fri Apr 26/Sat Apr 27	12 53	20 12 21 45 5 09 6 42	10 38 18 03	23 21 ..... 89 16 53.5 -27 40	7.4
Sat Apr 27/Sun Apr 28	12 57	20 13 21 46 5 08 6 41	10 43 18 06	0 23 ..... 82 17 52.0 -28 59	7.4
Sun Apr 28/Mon Apr 29	13 01	20 14 21 47 5 06 6 40	10 48 18 08	1 20 ..... 73 18 51.9 -28 42	7.3
Mon Apr 29/Tue Apr 30	13 05	20 14 21 49 5 05 6 39	10 53 18 11	2 10 ..... 63 19 51.6 -26 48	7.3
Tue Apr 30/Wed May 01	13 09	20 15 21 50 5 04 6 38	10 58 18 13	2 53 ..... 52 20 49.6 -23 22	7.2





Calendar for OU Norman, west longitude (h.m.s) = 6 29 47, latitude (d.m) = 35 12.2  
Rise/set times in Central time ( 6 hr W), uncorrected for elevation, DAYLIGHT time used, \* shows clock reset.  
Moon info is for local midnight, even if moon is down. Program: John Thorstensen, Dartmouth College.

\*\*\*\*\* 2024 SEPTEMBER \*\*\*\*\*

Table with columns: Date (eve/morn), LMST midn, Sun: set twi.end twi.beg rise, LST twilight: eve morn, Moon: rise set %illum RA Dec, Twi-Twi hours. Rows list dates from Sep 01 to Sep 30 with corresponding astronomical data.

\*\*\*\*\* 2024 OCTOBER \*\*\*\*\*

Table with columns: Date (eve/morn), LMST midn, Sun: set twi.end twi.beg rise, LST twilight: eve morn, Moon: rise set %illum RA Dec, Twi-Twi hours. Rows list dates from Oct 01 to Oct 31 with corresponding astronomical data.

Calendar for OU Norman, west longitude (h.m.s) = 6 29 47, latitude (d.m) = 35 12.2  
 Rise/set times in Central time ( 6 hr W), uncorrected for elevation, 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	----- set	Sun:----- twi.end twi.beg	rise	LST twilight: eve morn	----- rise	Moon:----- set %illum	RA	Dec	Twi-Twi hours	
Fri Nov 01/Sat Nov 02	1 18	18 35	20 00	6 27 7 53	21 18 7 46	.....	18 31 1	14 55.6	-20 39	10.4	
Sat Nov 02/Sun Nov 03*	1 22	18 34	20 00	5 27 6 54	21 21 7 50	.....	19 03 3	15 44.8	-24 25	10.5	
Sun Nov 03/Mon Nov 04	2 26	17 33	18 59	5 28 6 55	21 24 7 55	.....	18 42 7	16 40.1	-27 12	10.5	
Mon Nov 04/Tue Nov 05	2 30	17 32	18 58	5 29 6 56	21 27 8 00	.....	19 28 13	17 35.4	-28 39	10.5	
Tue Nov 05/Wed Nov 06	2 34	17 31	18 57	5 30 6 56	21 30 8 05	.....	20 23 20	18 32.3	-28 39	10.5	
Wed Nov 06/Thu Nov 07	2 38	17 30	18 57	5 31 6 57	21 34 8 10	.....	21 24 29	19 29.7	-27 10	10.6	
Thu Nov 07/Fri Nov 08	2 42	17 29	18 56	5 32 6 58	21 37 8 14	.....	22 31 39	20 26.1	-24 12	10.6	
Fri Nov 08/Sat Nov 09	2 46	17 28	18 55	5 32 6 59	21 40 8 19	.....	23 39 49	21 20.9	-19 53	10.6	
Sat Nov 09/Sun Nov 10	2 50	17 28	18 55	5 33 7 00	21 43 8 24	.....	0 49 60	22 14.0	-14 26	10.6	
Sun Nov 10/Mon Nov 11	2 54	17 27	18 54	5 34 7 01	21 47 8 29	.....	1 58 71	23 05.9	- 8 06	10.7	
Mon Nov 11/Tue Nov 12	2 58	17 26	18 53	5 35 7 02	21 50 8 34	.....	3 09 81	23 57.6	- 1 12	10.7	
Tue Nov 12/Wed Nov 13	3 02	17 25	18 53	5 36 7 03	21 54 8 38	.....	4 20 90	0 50.3	5 55	10.7	
Wed Nov 13/Thu Nov 14	3 06	17 25	18 52	5 37 7 04	21 57 8 43	15 53	5 34 96	1 45.1	12 47	10.7	
Thu Nov 14/Fri Nov 15	3 10	17 24	18 52	5 37 7 05	22 00 8 48	16 27	6 51 99	2 43.2	18 56	10.8	
Fri Nov 15/Sat Nov 16	3 13	17 23	18 51	5 38 7 06	22 04 8 53	17 06	8 08 100	3 44.9	23 50	10.8	
Sat Nov 16/Sun Nov 17	3 17	17 23	18 51	5 39 7 07	22 07 8 57	17 54	.....	97	4 49.4	27 02	10.8
Sun Nov 17/Mon Nov 18	3 21	17 22	18 50	5 40 7 08	22 11 9 02	18 49	.....	92	5 54.7	28 18	10.8
Mon Nov 18/Tue Nov 19	3 25	17 22	18 50	5 41 7 09	22 14 9 07	19 52	.....	85	6 58.3	27 39	10.8
Tue Nov 19/Wed Nov 20	3 29	17 21	18 50	5 42 7 10	22 18 9 12	20 59	.....	76	7 57.9	25 21	10.9
Wed Nov 20/Thu Nov 21	3 33	17 21	18 49	5 42 7 11	22 22 9 17	22 05	.....	67	8 52.6	21 45	10.9
Thu Nov 21/Fri Nov 22	3 37	17 20	18 49	5 43 7 12	22 25 9 21	23 08	.....	57	9 42.6	17 15	10.9
Fri Nov 22/Sat Nov 23	3 41	17 20	18 49	5 44 7 13	22 29 9 26	0 09	.....	47	10 28.8	12 10	10.9
Sat Nov 23/Sun Nov 24	3 45	17 19	18 48	5 45 7 14	22 33 9 31	1 07	.....	38	11 12.2	6 44	10.9
Sun Nov 24/Mon Nov 25	3 49	17 19	18 48	5 46 7 15	22 36 9 36	2 03	.....	29	11 54.0	1 08	11.0
Mon Nov 25/Tue Nov 26	3 53	17 19	18 48	5 47 7 16	22 40 9 40	2 58	.....	21	12 35.3	- 4 27	11.0
Tue Nov 26/Wed Nov 27	3 57	17 18	18 48	5 47 7 17	22 44 9 45	3 55	.....	14	13 17.2	- 9 53	11.0
Wed Nov 27/Thu Nov 28	4 01	17 18	18 48	5 48 7 18	22 48 9 50	4 53	.....	8	14 00.6	-15 01	11.0
Thu Nov 28/Fri Nov 29	4 05	17 18	18 48	5 49 7 19	22 51 9 55	5 53	15 33	4	14 46.4	-19 39	11.0
Fri Nov 29/Sat Nov 30	4 09	17 18	18 47	5 50 7 20	22 55 9 59	6 55	16 03	1	15 35.3	-23 34	11.0
Sat Nov 30/Sun Dec 01	4 13	17 18	18 47	5 51 7 20	22 59 10 04	7 57	16 40	0	16 27.4	-26 30	11.1

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

Date (eve/morn)	LMST midn	----- set	Sun:----- twi.end twi.beg	rise	LST twilight: eve morn	----- rise	Moon:----- set %illum	RA	Dec	Twi-Twi hours	
Sun Dec 01/Mon Dec 02	4 17	17 18	18 47	5 51 7 21	23 03 10 09	.....	17 25 1	17 22.6	-28 14	11.1	
Mon Dec 02/Tue Dec 03	4 20	17 17	18 47	5 52 7 22	23 07 10 13	.....	18 18 4	18 19.8	-28 32	11.1	
Tue Dec 03/Wed Dec 04	4 24	17 17	18 47	5 53 7 23	23 11 10 18	.....	19 18 9	19 17.3	-27 20	11.1	
Wed Dec 04/Thu Dec 05	4 28	17 17	18 48	5 54 7 24	23 15 10 23	.....	20 24 16	20 13.9	-24 39	11.1	
Thu Dec 05/Fri Dec 06	4 32	17 17	18 48	5 54 7 25	23 19 10 28	.....	21 32 24	21 08.6	-20 38	11.1	
Fri Dec 06/Sat Dec 07	4 36	17 17	18 48	5 55 7 25	23 23 10 32	.....	22 40 34	22 01.0	-15 30	11.1	
Sat Dec 07/Sun Dec 08	4 40	17 17	18 48	5 56 7 26	23 27 10 37	.....	23 48 45	22 51.7	- 9 32	11.1	
Sun Dec 08/Mon Dec 09	4 44	17 18	18 48	5 56 7 27	23 31 10 42	.....	0 55 56	23 41.6	- 3 00	11.1	
Mon Dec 09/Tue Dec 10	4 48	17 18	18 48	5 57 7 28	23 36 10 46	.....	2 04 67	0 31.8	3 47	11.1	
Tue Dec 10/Wed Dec 11	4 52	17 18	18 49	5 58 7 29	23 40 10 51	.....	3 14 78	1 23.7	10 30	11.2	
Wed Dec 11/Thu Dec 12	4 56	17 18	18 49	5 58 7 29	23 44 10 55	.....	4 27 87	2 18.5	16 43	11.2	
Thu Dec 12/Fri Dec 13	5 00	17 18	18 49	5 59 7 30	23 48 11 00	.....	5 42 94	3 17.1	22 00	11.2	
Fri Dec 13/Sat Dec 14	5 04	17 19	18 49	6 00 7 31	23 52 11 05	15 40	6 56 98	4 19.5	25 53	11.2	
Sat Dec 14/Sun Dec 15	5 08	17 19	18 50	6 00 7 31	23 57 11 09	16 32	8 05 100	5 24.4	27 59	11.2	
Sun Dec 15/Mon Dec 16	5 12	17 19	18 50	6 01 7 32	0 01 11 14	17 32	.....	99	6 29.5	28 09	11.2
Mon Dec 16/Tue Dec 17	5 16	17 20	18 50	6 02 7 33	0 05 11 18	18 38	.....	95	7 32.0	26 27	11.2
Tue Dec 17/Wed Dec 18	5 20	17 20	18 51	6 02 7 33	0 10 11 23	19 46	.....	90	8 30.2	23 15	11.2
Wed Dec 18/Thu Dec 19	5 24	17 20	18 51	6 03 7 34	0 14 11 27	20 52	.....	82	9 23.4	18 56	11.2
Thu Dec 19/Fri Dec 20	5 27	17 21	18 52	6 03 7 34	0 18 11 32	21 55	.....	74	10 12.1	13 53	11.2
Fri Dec 20/Sat Dec 21	5 31	17 21	18 52	6 04 7 35	0 23 11 36	22 55	.....	65	10 57.3	8 25	11.2
Sat Dec 21/Sun Dec 22	5 35	17 22	18 53	6 04 7 35	0 27 11 41	23 53	.....	56	11 40.3	2 45	11.2
Sun Dec 22/Mon Dec 23	5 39	17 22	18 53	6 05 7 36	0 32 11 45	0 49	.....	46	12 22.1	- 2 54	11.2
Mon Dec 23/Tue Dec 24	5 43	17 23	18 54	6 05 7 36	0 36 11 49	1 45	.....	37	13 04.0	- 8 26	11.2
Tue Dec 24/Wed Dec 25	5 47	17 23	18 54	6 05 7 36	0 41 11 54	2 42	.....	28	13 47.0	-13 39	11.2
Wed Dec 25/Thu Dec 26	5 51	17 24	18 55	6 06 7 37	0 45 11 58	3 41	.....	20	14 32.0	-18 26	11.2
Thu Dec 26/Fri Dec 27	5 55	17 25	18 56	6 06 7 37	0 50 12 02	4 42	.....	13	15 20.0	-22 33	11.2
Fri Dec 27/Sat Dec 28	5 59	17 25	18 56	6 07 7 37	0 54 12 07	5 45	.....	7	16 11.4	-25 47	11.2
Sat Dec 28/Sun Dec 29	6 03	17 26	18 57	6 07 7 38	0 59 12 11	6 46	.....	3	17 06.1	-27 51	11.2
Sun Dec 29/Mon Dec 30	6 07	17 27	18 57	6 07 7 38	1 04 12 15	7 44	16 08	1	18 03.4	-28 32	11.2
Mon Dec 30/Tue Dec 31	6 11	17 27	18 58	6 08 7 38	1 08 12 19	.....	17 07	0	19 01.9	-27 42	11.2
Tue Dec 31/Wed Jan 01	6 15	17 28	18 59	6 08 7 38	1 13 12 24	.....	18 13	2	19 59.7	-25 18	11.1