

Grange Observatory

**ASTRONOMICAL ALMANAC
FOR YEAR 2019**

Introduction to Reports Generated by Astronomy Lab 2

In all reports, times and dates are in standard time (not daylight savings time or summer time). Times are in 24 hour format.

Abbreviations used in reports:

AU	Astronomical Units
D	Degrees
DEC	Declination
DIST	Distance
DSO	December Solstice
E	East
FM	Full Moon
FQ	First Quarter Moon
H	Hours
ILL FR,	
ILLUM FRAC	Illuminated Fraction
JSO	June Solstice
KM	Kilometers
LE	Lunar Eclipse
LQ	Last Quarter Moon
M	Minutes
MEQ	March Equinox
MR	Moon Rise
MS	Moon Set
N	North
NM	New Moon
RA	Right Ascension
S	South, Seconds
SE	Solar Eclipse
SEQ	September Equinox
SR	Sunrise
SS	Sunset
UT	Universal Time
W	West
ZHR	Zenithal Hourly Rate

Grange Obs. Latitude: 45°08'32" N Longitude: 7°08'26" E
 Local Time = UT + 1.00 hours Elevation: 470 meters

Calendar Report for 01/01/2019 to 31/12/2019

January 2019

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4	5
		SR: 08:10	SR: 08:10	SR: 08:10	SR: 08:10	SR: 08:10
		SS: 17:00	SS: 17:01	SS: 17:02	SS: 17:03	SS: 17:04
		MR: 03:27	MR: 04:33	MR: 05:36	MR: 06:37	MR: 07:32
		MS: 14:08	MS: 14:39	MS: 15:15	MS: 15:57	MS: 16:43
6	7	8	9	10	11	12
SR: 08:10	SR: 08:10	SR: 08:10	SR: 08:09	SR: 08:09	SR: 08:09	SR: 08:08
SS: 17:05	SS: 17:06	SS: 17:07	SS: 17:08	SS: 17:09	SS: 17:10	SS: 17:11
MR: 08:22	MR: 09:05	MR: 09:43	MR: 10:15	MR: 10:43	MR: 11:09	MR: 11:33
MS: 17:35	MS: 18:30	MS: 19:28	MS: 20:28	MS: 21:28	MS: 22:29	MS: 23:30
NM: 02:30						
SE: 02:44						
13	14	15	16	17	18	19
SR: 08:08	SR: 08:07	SR: 08:07	SR: 08:06	SR: 08:06	SR: 08:05	SR: 08:04
SS: 17:13	SS: 17:14	SS: 17:15	SS: 17:16	SS: 17:18	SS: 17:19	SS: 17:20
MR: 11:57	MR: 12:22	MR: 12:49	MR: 13:19	MR: 13:55	MR: 14:40	MR: 15:34
MS: None	MS: 00:32	MS: 01:37	MS: 02:43	MS: 03:53	MS: 05:03	MS: 06:13
	FQ: 07:46					
20	21	22	23	24	25	26
SR: 08:04	SR: 08:03	SR: 08:02	SR: 08:01	SR: 08:00	SR: 07:59	SR: 07:58
SS: 17:22	SS: 17:23	SS: 17:24	SS: 17:26	SS: 17:27	SS: 17:28	SS: 17:30
MR: 16:38	MR: 17:51	MR: 19:09	MR: 20:28	MR: 21:44	MR: 22:58	MR: None
MS: 07:17	MS: 08:14	MS: 09:01	MS: 09:41	MS: 10:16	MS: 10:46	MS: 11:14
	FM: 06:17					
	LE: 06:12					
27	28	29	30	31		
SR: 07:57	SR: 07:56	SR: 07:55	SR: 07:54	SR: 07:53		
SS: 17:31	SS: 17:33	SS: 17:34	SS: 17:36	SS: 17:37		
MR: 00:10	MR: 01:19	MR: 02:26	MR: 03:30	MR: 04:31		
MS: 11:42	MS: 12:11	MS: 12:42	MS: 13:17	MS: 13:56		
LQ: 22:12						

February 2019

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2
					SR: 07:52	SR: 07:51
					SS: 17:38	SS: 17:40
					MR: 05:28	MR: 06:19
					MS: 14:40	MS: 15:30
3	4	5	6	7	8	9
SR: 07:50	SR: 07:48	SR: 07:47	SR: 07:46	SR: 07:45	SR: 07:43	SR: 07:42
SS: 17:41	SS: 17:43	SS: 17:44	SS: 17:46	SS: 17:47	SS: 17:49	SS: 17:50
MR: 07:04	MR: 07:43	MR: 08:17	MR: 08:46	MR: 09:13	MR: 09:38	MR: 10:01
MS: 16:24	MS: 17:21	MS: 18:20	MS: 19:21	MS: 20:21	MS: 21:22	MS: 22:23
	NM: 22:05					
10	11	12	13	14	15	16
SR: 07:41	SR: 07:39	SR: 07:38	SR: 07:36	SR: 07:35	SR: 07:33	SR: 07:32
SS: 17:51	SS: 17:53	SS: 17:54	SS: 17:56	SS: 17:57	SS: 17:59	SS: 18:00
MR: 10:25	MR: 10:50	MR: 11:18	MR: 11:51	MR: 12:29	MR: 13:17	MR: 14:14
MS: 23:26	MS: None	MS: 00:30	MS: 01:36	MS: 02:44	MS: 03:51	MS: 04:56
		FQ: 23:27				
17	18	19	20	21	22	23
SR: 07:30	SR: 07:29	SR: 07:27	SR: 07:25	SR: 07:24	SR: 07:22	SR: 07:20
SS: 18:01	SS: 18:03	SS: 18:04	SS: 18:06	SS: 18:07	SS: 18:08	SS: 18:10
MR: 15:22	MR: 16:37	MR: 17:56	MR: 19:16	MR: 20:34	MR: 21:50	MR: 23:03
MS: 05:56	MS: 06:48	MS: 07:32	MS: 08:09	MS: 08:42	MS: 09:12	MS: 09:41
		FM: 16:54				
24	25	26	27	28		
SR: 07:19	SR: 07:17	SR: 07:15	SR: 07:14	SR: 07:12		
SS: 18:11	SS: 18:13	SS: 18:14	SS: 18:15	SS: 18:17		
MR: None	MR: 00:13	MR: 01:20	MR: 02:24	MR: 03:23		
MS: 10:11	MS: 10:42	MS: 11:16	MS: 11:54	MS: 12:37		
		LQ: 12:30				

March 2019

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2
					SR: 07:10	SR: 07:08
					SS: 18:18	SS: 18:20
					MR: 04:16	MR: 05:03
					MS: 13:25	MS: 14:18
3	4	5	6	7	8	9
SR: 07:07	SR: 07:05	SR: 07:03	SR: 07:01	SR: 07:00	SR: 06:58	SR: 06:56
SS: 18:21	SS: 18:22	SS: 18:24	SS: 18:25	SS: 18:26	SS: 18:28	SS: 18:29
MR: 05:44	MR: 06:19	MR: 06:50	MR: 07:17	MR: 07:42	MR: 08:06	MR: 08:29
MS: 15:14	MS: 16:13	MS: 17:13	MS: 18:14	MS: 19:15	MS: 20:17	MS: 21:19
			NM: 17:05			
10	11	12	13	14	15	16
SR: 06:54	SR: 06:52	SR: 06:50	SR: 06:49	SR: 06:47	SR: 06:45	SR: 06:43
SS: 18:30	SS: 18:32	SS: 18:33	SS: 18:34	SS: 18:36	SS: 18:37	SS: 18:38
MR: 08:54	MR: 09:21	MR: 09:51	MR: 10:26	MR: 11:09	MR: 12:00	MR: 13:01
MS: 22:23	MS: 23:28	MS: None	MS: 00:34	MS: 01:40	MS: 02:44	MS: 03:43
				FQ: 11:27		
17	18	19	20	21	22	23
SR: 06:41	SR: 06:39	SR: 06:37	SR: 06:35	SR: 06:34	SR: 06:32	SR: 06:30
SS: 18:40	SS: 18:41	SS: 18:42	SS: 18:43	SS: 18:45	SS: 18:46	SS: 18:47
MR: 14:11	MR: 15:26	MR: 16:45	MR: 18:04	MR: 19:22	MR: 20:38	MR: 21:52
MS: 04:37	MS: 05:23	MS: 06:02	MS: 06:37	MS: 07:08	MS: 07:37	MS: 08:07
				FM: 02:43		
			MEQ:23:00			
24	25	26	27	28	29	30
SR: 06:28	SR: 06:26	SR: 06:24	SR: 06:22	SR: 06:20	SR: 06:18	SR: 06:17
SS: 18:49	SS: 18:50	SS: 18:51	SS: 18:52	SS: 18:54	SS: 18:55	SS: 18:56
MR: 23:03	MR: None	MR: 00:11	MR: 01:14	MR: 02:11	MR: 03:00	MR: 03:44
MS: 08:38	MS: 09:11	MS: 09:49	MS: 10:31	MS: 11:18	MS: 12:10	MS: 13:06
				LQ: 05:11		
31						
SR: 06:15						
SS: 18:58						
MR: 04:21						
MS: 14:04						

April 2019

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1	2	3	4	5	6
	SR: 06:13	SR: 06:11	SR: 06:09	SR: 06:07	SR: 06:05	SR: 06:04
	SS: 18:59	SS: 19:00	SS: 19:01	SS: 19:03	SS: 19:04	SS: 19:05
	MR: 04:52	MR: 05:21	MR: 05:46	MR: 06:10	MR: 06:34	MR: 06:58
	MS: 15:04	MS: 16:05	MS: 17:06	MS: 18:08	MS: 19:11	MS: 20:15
					NM: 09:52	
7	8	9	10	11	12	13
SR: 06:02	SR: 06:00	SR: 05:58	SR: 05:56	SR: 05:55	SR: 05:53	SR: 05:51
SS: 19:06	SS: 19:08	SS: 19:09	SS: 19:10	SS: 19:12	SS: 19:13	SS: 19:14
MR: 07:24	MR: 07:53	MR: 08:26	MR: 09:06	MR: 09:54	MR: 10:51	MR: 11:56
MS: 21:21	MS: 22:27	MS: 23:34	MS: None	MS: 00:38	MS: 01:39	MS: 02:33
					FQ: 20:06	
14	15	16	17	18	19	20
SR: 05:49	SR: 05:47	SR: 05:46	SR: 05:44	SR: 05:42	SR: 05:40	SR: 05:39
SS: 19:15	SS: 19:17	SS: 19:18	SS: 19:19	SS: 19:20	SS: 19:22	SS: 19:23
MR: 13:07	MR: 14:22	MR: 15:39	MR: 16:55	MR: 18:12	MR: 19:27	MR: 20:40
MS: 03:19	MS: 03:59	MS: 04:34	MS: 05:05	MS: 05:35	MS: 06:03	MS: 06:33
					FM: 12:12	
21	22	23	24	25	26	27
SR: 05:37	SR: 05:35	SR: 05:34	SR: 05:32	SR: 05:30	SR: 05:29	SR: 05:27
SS: 19:24	SS: 19:26	SS: 19:27	SS: 19:28	SS: 19:29	SS: 19:31	SS: 19:32
MR: 21:52	MR: 22:59	MR: None	MR: None	MR: 00:54	MR: 01:41	MR: 02:21
MS: 07:05	MS: 07:41	MS: 08:22	MS: 09:08	MS: 09:59	MS: 10:55	MS: 11:53
					LQ: 23:19	
28	29	30				
SR: 05:26	SR: 05:24	SR: 05:23				
SS: 19:33	SS: 19:34	SS: 19:36				
MR: 02:54	MR: 03:24	MR: 03:50				
MS: 12:53	MS: 13:53	MS: 14:55				

May 2019

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1	2	3	4
			SR: 05:21	SR: 05:20	SR: 05:18	SR: 05:17
			SS: 19:37	SS: 19:38	SS: 19:39	SS: 19:41
			MR: 04:14	MR: 04:37	MR: 05:01	MR: 05:26
			MS: 15:56	MS: 16:59	MS: 18:03	MS: 19:09
						NM: 23:47
5	6	7	8	9	10	11
SR: 05:15	SR: 05:14	SR: 05:13	SR: 05:11	SR: 05:10	SR: 05:09	SR: 05:07
SS: 19:42	SS: 19:43	SS: 19:44	SS: 19:46	SS: 19:47	SS: 19:48	SS: 19:49
MR: 05:54	MR: 06:26	MR: 07:04	MR: 07:50	MR: 08:44	MR: 09:47	MR: 10:56
MS: 20:17	MS: 21:25	MS: 22:32	MS: 23:35	MS: None	MS: 00:31	MS: 01:20
12	13	14	15	16	17	18
SR: 05:06	SR: 05:05	SR: 05:04	SR: 05:03	SR: 05:01	SR: 05:00	SR: 04:59
SS: 19:50	SS: 19:52	SS: 19:53	SS: 19:54	SS: 19:55	SS: 19:56	SS: 19:57
MR: 12:09	MR: 13:24	MR: 14:38	MR: 15:52	MR: 17:06	MR: 18:19	MR: 19:31
MS: 02:01	MS: 02:37	MS: 03:08	MS: 03:36	MS: 04:04	MS: 04:32	MS: 05:02
FQ: 02:13						FM: 22:12
19	20	21	22	23	24	25
SR: 04:58	SR: 04:57	SR: 04:56	SR: 04:55	SR: 04:54	SR: 04:53	SR: 04:53
SS: 19:58	SS: 19:59	SS: 20:01	SS: 20:02	SS: 20:03	SS: 20:04	SS: 20:05
MR: 20:41	MR: 21:46	MR: 22:44	MR: 23:35	MR: None	MR: 00:18	MR: 00:55
MS: 05:36	MS: 06:14	MS: 06:58	MS: 07:47	MS: 08:42	MS: 09:40	MS: 10:40
26	27	28	29	30	31	
SR: 04:52	SR: 04:51	SR: 04:50	SR: 04:50	SR: 04:49	SR: 04:48	
SS: 20:06	SS: 20:07	SS: 20:08	SS: 20:09	SS: 20:09	SS: 20:10	
MR: 01:26	MR: 01:53	MR: 02:18	MR: 02:41	MR: 03:04	MR: 03:28	
MS: 11:40	MS: 12:41	MS: 13:43	MS: 14:44	MS: 15:48	MS: 16:53	
LQ: 17:35						

June 2019

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1 SR: 04:48 SS: 20:11 MR: 03:54 MS: 18:00
2 SR: 04:47 SS: 20:12 MR: 04:24 MS: 19:09	3 SR: 04:47 SS: 20:13 MR: 05:00 MS: 20:18 NM: 11:03	4 SR: 04:46 SS: 20:14 MR: 05:43 MS: 21:25	5 SR: 04:46 SS: 20:14 MR: 06:36 MS: 22:26	6 SR: 04:45 SS: 20:15 MR: 07:37 MS: 23:19	7 SR: 04:45 SS: 20:16 MR: 08:46 MS: None	8 SR: 04:45 SS: 20:17 MR: 09:59 MS: 00:03
9 SR: 04:44 SS: 20:17 MR: 11:14 MS: 00:40	10 SR: 04:44 SS: 20:18 MR: 12:28 MS: 01:12 FQ: 07:01	11 SR: 04:44 SS: 20:18 MR: 13:41 MS: 01:41	12 SR: 04:44 SS: 20:19 MR: 14:53 MS: 02:08	13 SR: 04:44 SS: 20:19 MR: 16:05 MS: 02:35	14 SR: 04:44 SS: 20:20 MR: 17:16 MS: 03:03	15 SR: 04:44 SS: 20:20 MR: 18:25 MS: 03:35
16 SR: 04:44 SS: 20:21 MR: 19:32 MS: 04:10	17 SR: 04:44 SS: 20:21 MR: 20:33 MS: 04:51 FM: 09:31	18 SR: 04:44 SS: 20:22 MR: 21:27 MS: 05:38	19 SR: 04:44 SS: 20:22 MR: 22:14 MS: 06:30	20 SR: 04:44 SS: 20:22 MR: 22:53 MS: 07:27	21 SR: 04:44 SS: 20:22 MR: 23:27 MS: 08:27 JSO:16:55	22 SR: 04:44 SS: 20:23 MR: 23:55 MS: 09:28
23 SR: 04:45 SS: 20:23 MR: None MS: 10:29	24 SR: 04:45 SS: 20:23 MR: 00:21 MS: 11:30	25 SR: 04:45 SS: 20:23 MR: 00:44 MS: 12:31 LQ: 10:48	26 SR: 04:46 SS: 20:23 MR: 01:07 MS: 13:32	27 SR: 04:46 SS: 20:23 MR: 01:30 MS: 14:36	28 SR: 04:46 SS: 20:23 MR: 01:55 MS: 15:41	29 SR: 04:47 SS: 20:23 MR: 02:22 MS: 16:49
30 SR: 04:47 SS: 20:23 MR: 02:55 MS: 17:58						

July 2019

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1	2	3	4	5	6
	SR: 04:48	SR: 04:48	SR: 04:49	SR: 04:50	SR: 04:50	SR: 04:51
	SS: 20:23	SS: 20:22	SS: 20:22	SS: 20:22	SS: 20:21	SS: 20:21
	MR: 03:34	MR: 04:23	MR: 05:21	MR: 06:29	MR: 07:43	MR: 09:00
	MS: 19:07	MS: 20:12	MS: 21:10	MS: 21:59	MS: 22:40	MS: 23:15
		NM: 20:17				
		SE: 20:23				
7	8	9	10	11	12	13
SR: 04:52	SR: 04:52	SR: 04:53	SR: 04:54	SR: 04:55	SR: 04:56	SR: 04:56
SS: 20:21	SS: 20:20	SS: 20:20	SS: 20:19	SS: 20:19	SS: 20:18	SS: 20:18
MR: 10:16	MR: 11:31	MR: 12:44	MR: 13:56	MR: 15:06	MR: 16:15	MR: 17:22
MS: 23:45	MS: None	MS: 00:13	MS: 00:40	MS: 01:08	MS: 01:37	MS: 02:10
		FQ: 11:57				
14	15	16	17	18	19	20
SR: 04:57	SR: 04:58	SR: 04:59	SR: 05:00	SR: 05:01	SR: 05:02	SR: 05:03
SS: 20:17	SS: 20:16	SS: 20:15	SS: 20:15	SS: 20:14	SS: 20:13	SS: 20:12
MR: 18:24	MR: 19:20	MR: 20:10	MR: 20:52	MR: 21:27	MR: 21:57	MR: 22:24
MS: 02:48	MS: 03:32	MS: 04:22	MS: 05:18	MS: 06:16	MS: 07:17	MS: 08:18
		FM: 22:40				
		LE: 22:33				
21	22	23	24	25	26	27
SR: 05:04	SR: 05:05	SR: 05:06	SR: 05:07	SR: 05:08	SR: 05:09	SR: 05:10
SS: 20:11	SS: 20:10	SS: 20:09	SS: 20:08	SS: 20:07	SS: 20:06	SS: 20:05
MR: 22:48	MR: 23:10	MR: 23:33	MR: 23:56	MR: None	MR: 00:22	MR: 00:51
MS: 09:19	MS: 10:19	MS: 11:20	MS: 12:22	MS: 13:25	MS: 14:30	MS: 15:38
				LQ: 02:20		
28	29	30	31			
SR: 05:11	SR: 05:12	SR: 05:14	SR: 05:15			
SS: 20:04	SS: 20:03	SS: 20:01	SS: 20:00			
MR: 01:26	MR: 02:10	MR: 03:03	MR: 04:07			
MS: 16:46	MS: 17:52	MS: 18:54	MS: 19:48			

August 2019

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2	3
				SR: 05:16	SR: 05:17	SR: 05:18
				SS: 19:59	SS: 19:58	SS: 19:56
				MR: 05:19	MR: 06:37	MR: 07:57
				MS: 20:34	MS: 21:12	MS: 21:45
				NM: 04:13		
4	5	6	7	8	9	10
SR: 05:19	SR: 05:20	SR: 05:22	SR: 05:23	SR: 05:24	SR: 05:25	SR: 05:26
SS: 19:55	SS: 19:54	SS: 19:52	SS: 19:51	SS: 19:50	SS: 19:48	SS: 19:47
MR: 09:15	MR: 10:31	MR: 11:45	MR: 12:57	MR: 14:07	MR: 15:15	MR: 16:18
MS: 22:15	MS: 22:43	MS: 23:11	MS: 23:40	MS: None	MS: 00:12	MS: 00:49
			FQ: 18:33			
11	12	13	14	15	16	17
SR: 05:28	SR: 05:29	SR: 05:30	SR: 05:31	SR: 05:32	SR: 05:34	SR: 05:35
SS: 19:45	SS: 19:44	SS: 19:42	SS: 19:40	SS: 19:39	SS: 19:37	SS: 19:36
MR: 17:16	MR: 18:07	MR: 18:51	MR: 19:28	MR: 20:00	MR: 20:27	MR: 20:52
MS: 01:30	MS: 02:18	MS: 03:11	MS: 04:09	MS: 05:09	MS: 06:09	MS: 07:10
				FM: 13:31		
18	19	20	21	22	23	24
SR: 05:36	SR: 05:37	SR: 05:38	SR: 05:39	SR: 05:41	SR: 05:42	SR: 05:43
SS: 19:34	SS: 19:32	SS: 19:31	SS: 19:29	SS: 19:27	SS: 19:26	SS: 19:24
MR: 21:15	MR: 21:37	MR: 21:59	MR: 22:23	MR: 22:50	MR: 23:22	MR: None
MS: 08:11	MS: 09:12	MS: 10:13	MS: 11:14	MS: 12:18	MS: 13:23	MS: 14:29
					LQ: 15:59	
25	26	27	28	29	30	31
SR: 05:44	SR: 05:46	SR: 05:47	SR: 05:48	SR: 05:49	SR: 05:50	SR: 05:52
SS: 19:22	SS: 19:20	SS: 19:19	SS: 19:17	SS: 19:15	SS: 19:13	SS: 19:11
MR: 00:00	MR: 00:47	MR: 01:45	MR: 02:52	MR: 04:08	MR: 05:28	MR: 06:48
MS: 15:34	MS: 16:37	MS: 17:34	MS: 18:23	MS: 19:05	MS: 19:41	MS: 20:12
					NM: 11:38	

September 2019

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2	3	4	5	6	7
SR: 05:53	SR: 05:54	SR: 05:55	SR: 05:56	SR: 05:58	SR: 05:59	SR: 06:00
SS: 19:10	SS: 19:08	SS: 19:06	SS: 19:04	SS: 19:02	SS: 19:00	SS: 18:58
MR: 08:08	MR: 09:26	MR: 10:42	MR: 11:55	MR: 13:05	MR: 14:11	MR: 15:12
MS: 20:42	MS: 21:10	MS: 21:40	MS: 22:12	MS: 22:48	MS: 23:28	MS: None
					FQ: 04:12	
8	9	10	11	12	13	14
SR: 06:01	SR: 06:02	SR: 06:03	SR: 06:05	SR: 06:06	SR: 06:07	SR: 06:08
SS: 18:57	SS: 18:55	SS: 18:53	SS: 18:51	SS: 18:49	SS: 18:47	SS: 18:45
MR: 16:05	MR: 16:51	MR: 17:30	MR: 18:03	MR: 18:31	MR: 18:56	MR: 19:20
MS: 00:14	MS: 01:06	MS: 02:02	MS: 03:01	MS: 04:02	MS: 05:03	MS: 06:04
						FM: 05:35
15	16	17	18	19	20	21
SR: 06:09	SR: 06:11	SR: 06:12	SR: 06:13	SR: 06:14	SR: 06:15	SR: 06:17
SS: 18:43	SS: 18:41	SS: 18:39	SS: 18:37	SS: 18:36	SS: 18:34	SS: 18:32
MR: 19:42	MR: 20:04	MR: 20:27	MR: 20:53	MR: 21:22	MR: 21:57	MR: 22:39
MS: 07:05	MS: 08:06	MS: 09:08	MS: 10:10	MS: 11:14	MS: 12:19	MS: 13:23
22	23	24	25	26	27	28
SR: 06:18	SR: 06:19	SR: 06:20	SR: 06:22	SR: 06:23	SR: 06:24	SR: 06:25
SS: 18:30	SS: 18:28	SS: 18:26	SS: 18:24	SS: 18:22	SS: 18:20	SS: 18:18
MR: 23:30	MR: None	MR: 00:32	MR: 01:42	MR: 02:58	MR: 04:17	MR: 05:38
MS: 14:25	MS: 15:23	MS: 16:13	MS: 16:57	MS: 17:35	MS: 18:08	MS: 18:38
LQ: 03:44						NM: 19:28
	SEQ:08:50					
29	30					
SR: 06:26	SR: 06:28					
SS: 18:16	SS: 18:15					
MR: 06:58	MR: 08:16					
MS: 19:07	MS: 19:36					

October 2019

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4	5
		SR: 06:29	SR: 06:30	SR: 06:31	SR: 06:33	SR: 06:34
		SS: 18:13	SS: 18:11	SS: 18:09	SS: 18:07	SS: 18:05
		MR: 09:34	MR: 10:48	MR: 11:59	MR: 13:04	MR: 14:01
		MS: 20:08	MS: 20:43	MS: 21:22	MS: 22:08	MS: 22:59
						FQ: 17:48
6	7	8	9	10	11	12
SR: 06:35	SR: 06:36	SR: 06:38	SR: 06:39	SR: 06:40	SR: 06:42	SR: 06:43
SS: 18:03	SS: 18:02	SS: 18:00	SS: 17:58	SS: 17:56	SS: 17:54	SS: 17:52
MR: 14:50	MR: 15:31	MR: 16:06	MR: 16:35	MR: 17:01	MR: 17:25	MR: 17:47
MS: 23:54	MS: None	MS: 00:53	MS: 01:54	MS: 02:55	MS: 03:56	MS: 04:57
13	14	15	16	17	18	19
SR: 06:44	SR: 06:45	SR: 06:47	SR: 06:48	SR: 06:49	SR: 06:51	SR: 06:52
SS: 17:51	SS: 17:49	SS: 17:47	SS: 17:45	SS: 17:44	SS: 17:42	SS: 17:40
MR: 18:09	MR: 18:32	MR: 18:56	MR: 19:24	MR: 19:57	MR: 20:36	MR: 21:24
MS: 05:58	MS: 07:00	MS: 08:03	MS: 09:07	MS: 10:12	MS: 11:17	MS: 12:20
FM: 22:11						
20	21	22	23	24	25	26
SR: 06:53	SR: 06:55	SR: 06:56	SR: 06:57	SR: 06:59	SR: 07:00	SR: 07:01
SS: 17:39	SS: 17:37	SS: 17:35	SS: 17:34	SS: 17:32	SS: 17:30	SS: 17:29
MR: 22:20	MR: 23:25	MR: None	MR: 00:37	MR: 01:53	MR: 03:10	MR: 04:29
MS: 13:18	MS: 14:10	MS: 14:54	MS: 15:32	MS: 16:06	MS: 16:36	MS: 17:04
	LQ: 13:42					
27	28	29	30	31		
SR: 07:03	SR: 07:04	SR: 07:05	SR: 07:07	SR: 07:08		
SS: 17:27	SS: 17:26	SS: 17:24	SS: 17:23	SS: 17:21		
MR: 05:47	MR: 07:05	MR: 08:23	MR: 09:37	MR: 10:47		
MS: 17:32	MS: 18:02	MS: 18:36	MS: 19:13	MS: 19:57		
	NM: 04:40					

November 2019

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2
					SR: 07:10	SR: 07:11
					SS: 17:20	SS: 17:18
					MR: 11:50	MR: 12:45
					MS: 20:47	MS: 21:42
3	4	5	6	7	8	9
SR: 07:12	SR: 07:14	SR: 07:15	SR: 07:16	SR: 07:18	SR: 07:19	SR: 07:21
SS: 17:17	SS: 17:16	SS: 17:14	SS: 17:13	SS: 17:12	SS: 17:11	SS: 17:09
MR: 13:30	MR: 14:07	MR: 14:39	MR: 15:06	MR: 15:30	MR: 15:52	MR: 16:14
MS: 22:42	MS: 23:43	MS: None	MS: 00:44	MS: 01:46	MS: 02:47	MS: 03:48
	FQ: 11:24					
10	11	12	13	14	15	16
SR: 07:22	SR: 07:23	SR: 07:25	SR: 07:26	SR: 07:28	SR: 07:29	SR: 07:30
SS: 17:08	SS: 17:07	SS: 17:06	SS: 17:05	SS: 17:04	SS: 17:03	SS: 17:02
MR: 16:36	MR: 17:00	MR: 17:26	MR: 17:57	MR: 18:35	MR: 19:20	MR: 20:14
MS: 04:50	MS: 05:53	MS: 06:57	MS: 08:03	MS: 09:10	MS: 10:14	MS: 11:15
		FM: 14:37				
17	18	19	20	21	22	23
SR: 07:32	SR: 07:33	SR: 07:34	SR: 07:36	SR: 07:37	SR: 07:38	SR: 07:40
SS: 17:01	SS: 17:00	SS: 16:59	SS: 16:58	SS: 16:57	SS: 16:56	SS: 16:56
MR: 21:16	MR: 22:26	MR: 23:39	MR: None	MR: 00:54	MR: 02:09	MR: 03:25
MS: 12:09	MS: 12:55	MS: 13:34	MS: 14:08	MS: 14:38	MS: 15:05	MS: 15:32
		LQ: 22:13				
24	25	26	27	28	29	30
SR: 07:41	SR: 07:42	SR: 07:43	SR: 07:45	SR: 07:46	SR: 07:47	SR: 07:48
SS: 16:55	SS: 16:54	SS: 16:54	SS: 16:53	SS: 16:52	SS: 16:52	SS: 16:51
MR: 04:41	MR: 05:57	MR: 07:13	MR: 08:25	MR: 09:33	MR: 10:33	MR: 11:23
MS: 16:00	MS: 16:31	MS: 17:05	MS: 17:46	MS: 18:33	MS: 19:27	MS: 20:26
		NM: 16:08				

December 2019

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2	3	4	5	6	7
SR: 07:49	SR: 07:51	SR: 07:52	SR: 07:53	SR: 07:54	SR: 07:55	SR: 07:56
SS: 16:51	SS: 16:51	SS: 16:50	SS: 16:50	SS: 16:50	SS: 16:50	SS: 16:49
MR: 12:05	MR: 12:40	MR: 13:09	MR: 13:34	MR: 13:56	MR: 14:18	MR: 14:39
MS: 21:28	MS: 22:30	MS: 23:32	MS: None	MS: 00:34	MS: 01:35	MS: 02:36
			FQ: 07:59			
8	9	10	11	12	13	14
SR: 07:57	SR: 07:58	SR: 07:59	SR: 08:00	SR: 08:01	SR: 08:01	SR: 08:02
SS: 16:49	SS: 16:49	SS: 16:49	SS: 16:49	SS: 16:49	SS: 16:49	SS: 16:50
MR: 15:02	MR: 15:27	MR: 15:56	MR: 16:31	MR: 17:14	MR: 18:06	MR: 19:07
MS: 03:38	MS: 04:42	MS: 05:48	MS: 06:55	MS: 08:02	MS: 09:06	MS: 10:04
				FM: 06:15		
15	16	17	18	19	20	21
SR: 08:03	SR: 08:04	SR: 08:04	SR: 08:05	SR: 08:06	SR: 08:06	SR: 08:07
SS: 16:50	SS: 16:50	SS: 16:50	SS: 16:51	SS: 16:51	SS: 16:51	SS: 16:52
MR: 20:16	MR: 21:29	MR: 22:43	MR: 23:58	MR: None	MR: 01:12	MR: 02:26
MS: 10:54	MS: 11:37	MS: 12:12	MS: 12:42	MS: 13:10	MS: 13:36	MS: 14:03
				LQ: 05:59		
22	23	24	25	26	27	28
SR: 08:07	SR: 08:08	SR: 08:08	SR: 08:09	SR: 08:09	SR: 08:09	SR: 08:10
SS: 16:52	SS: 16:53	SS: 16:53	SS: 16:54	SS: 16:55	SS: 16:55	SS: 16:56
MR: 03:40	MR: 04:54	MR: 06:06	MR: 07:15	MR: 08:19	MR: 09:14	MR: 10:00
MS: 14:31	MS: 15:03	MS: 15:39	MS: 16:23	MS: 17:13	MS: 18:10	MS: 19:12
				NM: 06:16		
				SE: 06:21		
DSO:05:19						
29	30	31				
SR: 08:10	SR: 08:10	SR: 08:10				
SS: 16:57	SS: 16:58	SS: 16:59				
MR: 10:38	MR: 11:09	MR: 11:36				
MS: 20:15	MS: 21:18	MS: 22:20				

Grange Obs. Latitude: 45°08'32" N Longitude: 7°08'26" E
Local Time = UT + 1.00 hours Elevation: 470 meters

Seasons Report for 2019

MEQ: 20/03/2019 23:00	Winter Length:	88.98 days
JSO: 21/06/2019 16:55	Spring Length:	92.75 days
SEQ: 23/09/2019 08:50	Summer Length:	93.66 days
DSO: 22/12/2019 05:19	Autumn Length:	89.85 days

Dates of Easter Report for 2019

21/04/2019

Grange Obs. Latitude: 45°08'32" N Longitude: 7°08'26" E
Local Time = UT + 1.00 hours Elevation: 470 meters

Lunar Eclipse Report for 2019

Lunar eclipse on 21/01/2019

Moon rise: 17:51
Moon set: 08:14
Magnitude: 1.19
Partial phase begins: 04:34
Total phase begins: 05:42
Time of maximum eclipse: 06:12
Total phase ends: 06:42
Partial phase ends: 07:50

Lunar eclipse on 16/07/2019

Moon rise: 20:10
Moon set: 04:22
Magnitude: 0.65
Partial phase begins: 21:05
Time of maximum eclipse: 22:33
Partial phase ends: 00:02

Grange Obs. Latitude: 45°08'32" N Longitude: 7°08'26" E
Local Time = UT + 1.00 hours Elevation: 470 meters

Solar Eclipse Report for 2019

Solar eclipse on 06/01/2019
Sun rise: 08:10
Sun set: 17:05
Time of maximum eclipse: 02:44
Eclipse is partial, maximum magnitude = 0.72
Eclipse is visible in the northern hemisphere

Solar eclipse on 02/07/2019
Sun rise: 04:48
Sun set: 20:22
Time of maximum eclipse: 20:23
Eclipse is total
Eclipse is visible in the southern hemisphere

Solar eclipse on 26/12/2019
Sun rise: 08:09
Sun set: 16:55
Time of maximum eclipse: 06:21
Eclipse is annular
Eclipse is visible in the northern hemisphere

The time of maximum eclipse (above) does not necessarily specify when the eclipse will be maximal when viewed from the specified location.

To see how the eclipse will look at the specified location, run a Planetarium movie of the eclipse.

Grange Obs. Latitude: 45°08'32" N Longitude: 7°08'26" E
 Local Time = UT + 1.00 hours Elevation: 470 meters

Planet View Info Report for 01/01/2019 to 31/12/2019

Mercury

Date	Rise	Set	RA	Dec	Elongation	Ill Fr	DIST(AU)
01/01/2019	07:02	15:46	17h33m16s	-23°10'11"	16°23'49"	0.893	1.29617
08/01/2019	07:25	16:00	18h18m50s	-24°03'56"	13°06'42"	0.938	1.36466
15/01/2019	07:44	16:21	19h06m17s	-23°56'46"	9°30'46"	0.969	1.40650
22/01/2019	07:58	16:49	19h54m51s	-22°42'15"	5°38'37"	0.988	1.42269
29/01/2019	08:07	17:24	20h43m56s	-20°16'10"	2°12'52"	0.998	1.41157
05/02/2019	08:11	18:03	21h33m01s	-16°36'39"	4°45'04"	0.989	1.36790
12/02/2019	08:11	18:45	22h21m08s	-11°47'36"	9°56'32"	0.938	1.28224
19/02/2019	08:04	19:25	23h05m43s	-6°10'26"	15°04'58"	0.797	1.14427
26/02/2019	07:49	19:51	23h40m07s	-0°48'25"	18°04'16"	0.530	0.95945
05/03/2019	07:21	19:46	23h53m58s	2°27'36"	15°44'10"	0.219	0.77205
12/03/2019	06:44	19:02	23h42m55s	2°06'32"	6°50'18"	0.028	0.64491
19/03/2019	06:07	18:00	23h20m33s	-1°05'31"	8°07'09"	0.032	0.60952
26/03/2019	05:40	17:09	23h08m05s	-4°14'23"	18°40'08"	0.161	0.64975
02/04/2019	05:23	16:43	23h12m46s	-5°33'42"	24°59'51"	0.309	0.73082
09/04/2019	05:11	16:38	23h31m04s	-4°58'21"	27°31'00"	0.436	0.82847
16/04/2019	05:03	16:48	23h58m26s	-2°50'28"	27°19'11"	0.543	0.93142
23/04/2019	04:55	17:08	0h32m10s	0°30'06"	25°07'13"	0.640	1.03491
30/04/2019	04:49	17:38	1h11m16s	4°47'51"	21°15'48"	0.737	1.13555
07/05/2019	04:46	18:17	1h56m05s	9°47'53"	15°50'58"	0.841	1.22740
14/05/2019	04:47	19:06	2h47m45s	15°08'44"	8°53'18"	0.943	1.29745
21/05/2019	04:55	20:02	3h46m59s	20°10'14"	0°42'03"	1.000	1.32257
28/05/2019	05:13	20:57	4h51m02s	23°50'45"	7°58'26"	0.946	1.28181
04/06/2019	05:39	21:38	5h53m05s	25°25'42"	15°26'35"	0.803	1.18332
11/06/2019	06:07	22:00	6h47m07s	25°02'42"	20°56'30"	0.644	1.05748
18/06/2019	06:32	22:04	7h30m28s	23°18'32"	24°13'38"	0.502	0.92833
25/06/2019	06:49	21:54	8h01m59s	20°52'21"	25°07'31"	0.374	0.80808
02/07/2019	06:51	21:31	8h20m24s	18°20'26"	23°15'19"	0.251	0.70380
09/07/2019	06:36	20:56	8h24m06s	16°19'05"	18°06'34"	0.132	0.62347
16/07/2019	06:01	20:13	8h13m08s	15°22'53"	9°53'00"	0.038	0.57985
23/07/2019	05:13	19:29	7h54m08s	15°47'41"	5°30'49"	0.013	0.58932
30/07/2019	04:27	18:57	7h41m14s	17°10'31"	13°04'17"	0.091	0.66257
06/08/2019	03:58	18:44	7h46m38s	18°39'31"	18°15'28"	0.267	0.79610
13/08/2019	03:55	18:48	8h13m56s	19°14'35"	18°36'00"	0.516	0.97102
20/08/2019	04:19	19:00	8h59m15s	17°59'29"	14°38'10"	0.778	1.14998
27/08/2019	05:02	19:10	9h52m58s	14°36'03"	8°13'03"	0.947	1.28711
03/09/2019	05:48	19:13	10h45m48s	9°43'50"	2°01'01"	0.998	1.36258
10/09/2019	06:32	19:11	11h34m06s	4°16'10"	5°31'31"	0.985	1.38658
17/09/2019	07:10	19:05	12h18m04s	-1°12'51"	10°49'35"	0.949	1.37464
24/09/2019	07:44	18:56	12h58m49s	-6°25'33"	15°21'38"	0.906	1.33665
01/10/2019	08:15	18:48	13h37m20s	-11°11'44"	19°07'27"	0.855	1.27709
08/10/2019	08:42	18:38	14h14m00s	-15°23'13"	22°05'52"	0.793	1.19720
15/10/2019	09:04	18:29	14h48m15s	-18°50'33"	24°05'33"	0.708	1.09674
22/10/2019	09:18	18:19	15h17m47s	-21°19'37"	24°32'55"	0.584	0.97612
29/10/2019	09:13	18:04	15h36m38s	-22°24'44"	22°06'14"	0.397	0.84146
05/11/2019	08:35	17:38	15h33m34s	-21°14'45"	14°04'55"	0.145	0.71910
12/11/2019	07:18	17:00	15h04m06s	-17°10'20"	0°51'58"	0.001	0.67706
19/11/2019	06:12	16:26	14h40m22s	-13°27'29"	14°35'46"	0.203	0.77214
26/11/2019	05:54	16:07	14h48m17s	-13°36'20"	19°47'45"	0.523	0.94420
03/12/2019	06:07	15:58	15h17m23s	-16°07'27"	19°22'46"	0.741	1.11030
10/12/2019	06:33	15:56	15h55m57s	-19°08'33"	16°47'12"	0.862	1.24125
17/12/2019	07:01	15:59	16h39m01s	-21°46'59"	13°28'36"	0.928	1.33566
24/12/2019	07:29	16:08	17h24m46s	-23°39'55"	9°55'47"	0.965	1.39787
31/12/2019	07:54	16:24	18h12m24s	-24°35'24"	6°17'01"	0.987	1.43147

Venus

Date	Rise	Set	RA	Dec	Elongation	Ill Fr	DIST(AU)
01/01/2019	04:19	14:17	15h27m59s	-15°18'38"	46°51'40"	0.474	0.63470
08/01/2019	04:27	14:11	15h56m32s	-16°54'37"	46°56'49"	0.512	0.68789
15/01/2019	04:36	14:07	16h26m44s	-18°22'36"	46°43'10"	0.546	0.74105
22/01/2019	04:46	14:05	16h58m24s	-19°36'44"	46°14'24"	0.579	0.79400
29/01/2019	04:56	14:06	17h31m19s	-20°32'03"	45°33'25"	0.609	0.84653
05/02/2019	05:05	14:10	18h05m12s	-21°04'25"	44°42'44"	0.637	0.89842
12/02/2019	05:12	14:17	18h39m45s	-21°10'50"	43°44'12"	0.664	0.94954
19/02/2019	05:18	14:26	19h14m40s	-20°49'32"	42°38'57"	0.689	0.99986
26/02/2019	05:21	14:38	19h49m37s	-19°59'55"	41°27'56"	0.712	1.04931
05/03/2019	05:22	14:51	20h24m22s	-18°42'32"	40°12'10"	0.735	1.09774
12/03/2019	05:21	15:06	20h58m41s	-16°59'04"	38°52'22"	0.756	1.14505
19/03/2019	05:17	15:22	21h32m24s	-14°52'00"	37°28'52"	0.776	1.19123
26/03/2019	05:12	15:38	22h05m29s	-12°24'20"	36°01'56"	0.795	1.23626
02/04/2019	05:05	15:55	22h37m59s	-9°39'26"	34°32'03"	0.814	1.28000
09/04/2019	04:57	16:11	23h09m57s	-6°41'03"	32°59'31"	0.831	1.32231
16/04/2019	04:48	16:28	23h41m31s	-3°32'57"	31°24'26"	0.848	1.36316
23/04/2019	04:39	16:45	0h12m51s	-0°18'54"	29°46'51"	0.864	1.40250
30/04/2019	04:30	17:02	0h44m09s	2°57'21"	28°07'01"	0.879	1.44020
07/05/2019	04:20	17:19	1h15m39s	6°11'56"	26°25'11"	0.893	1.47607
14/05/2019	04:12	17:36	1h47m30s	9°20'55"	24°41'24"	0.907	1.51002
21/05/2019	04:04	17:54	2h19m55s	12°20'20"	22°55'40"	0.920	1.54199
28/05/2019	03:57	18:12	2h53m04s	15°06'15"	21°08'13"	0.932	1.57187
04/06/2019	03:52	18:30	3h27m03s	17°34'34"	19°19'19"	0.943	1.59946
11/06/2019	03:49	18:47	4h01m57s	19°41'17"	17°29'02"	0.953	1.62462
18/06/2019	03:49	19:04	4h37m42s	21°22'37"	15°37'27"	0.963	1.64733
25/06/2019	03:52	19:19	5h14m13s	22°35'16"	13°44'50"	0.971	1.66750
02/07/2019	03:58	19:31	5h51m18s	23°16'33"	11°51'31"	0.979	1.68500
09/07/2019	04:07	19:42	6h28m40s	23°24'43"	9°57'43"	0.985	1.69970
16/07/2019	04:19	19:49	7h06m00s	22°59'11"	8°03'39"	0.990	1.71162
23/07/2019	04:33	19:53	7h43m01s	22°00'29"	6°09'56"	0.994	1.72076
30/07/2019	04:50	19:53	8h19m26s	20°30'16"	4°17'50"	0.997	1.72709
06/08/2019	05:08	19:52	8h55m05s	18°31'09"	2°31'17"	0.999	1.73054
13/08/2019	05:26	19:47	9h29m52s	16°06'28"	1°17'34"	1.000	1.73118
20/08/2019	05:45	19:41	10h03m46s	13°19'59"	2°05'20"	0.999	1.72911
27/08/2019	06:04	19:33	10h36m53s	10°15'41"	3°47'06"	0.998	1.72440
03/09/2019	06:23	19:24	11h09m21s	6°57'41"	5°36'15"	0.995	1.71704
10/09/2019	06:41	19:14	11h41m21s	3°30'12"	7°26'45"	0.992	1.70713
17/09/2019	07:00	19:04	12h13m06s	-0°02'35"	9°17'11"	0.987	1.69484
24/09/2019	07:18	18:54	12h44m51s	-3°36'34"	11°06'50"	0.982	1.68029
01/10/2019	07:37	18:44	13h16m50s	-7°07'34"	12°55'26"	0.975	1.66352
08/10/2019	07:56	18:35	13h49m17s	-10°31'14"	14°42'56"	0.968	1.64461
15/10/2019	08:15	18:27	14h22m24s	-13°43'09"	16°29'13"	0.960	1.62370
22/10/2019	08:35	18:20	14h56m23s	-16°38'52"	18°14'05"	0.952	1.60095
29/10/2019	08:54	18:16	15h31m20s	-19°13'52"	19°57'26"	0.942	1.57640
05/11/2019	09:13	18:14	16h07m18s	-21°23'43"	21°39'21"	0.932	1.55006
12/11/2019	09:31	18:15	16h44m11s	-23°04'15"	23°19'49"	0.921	1.52205
19/11/2019	09:47	18:19	17h21m49s	-24°12'01"	24°58'39"	0.910	1.49248
26/11/2019	10:00	18:27	17h59m55s	-24°44'29"	26°35'46"	0.897	1.46138
03/12/2019	10:10	18:39	18h38m07s	-24°40'17"	28°11'14"	0.884	1.42874
10/12/2019	10:16	18:53	19h16m02s	-23°59'29"	29°45'01"	0.871	1.39457
17/12/2019	10:19	19:10	19h53m17s	-22°43'33"	31°16'55"	0.856	1.35897
24/12/2019	10:19	19:28	20h29m36s	-20°55'05"	32°46'44"	0.840	1.32197
31/12/2019	10:15	19:46	21h04m50s	-18°37'36"	34°14'26"	0.824	1.28352

Mars

Date	Rise	Set	RA	Dec	Elongation	Ill Fr	DIST(AU)
01/01/2019	11:47	23:52	0h00m15s	-0°17'53"	79°40'38"	0.873	1.26105
08/01/2019	11:28	23:50	0h17m18s	1°42'57"	77°15'15"	0.877	1.32032
15/01/2019	11:10	23:47	0h34m29s	3°42'53"	74°51'08"	0.882	1.38012
22/01/2019	10:52	23:45	0h51m48s	5°41'06"	72°28'01"	0.887	1.44027
29/01/2019	10:34	23:43	1h09m15s	7°36'50"	70°05'31"	0.891	1.50068
05/02/2019	10:16	23:41	1h26m52s	9°29'28"	67°43'35"	0.897	1.56122
12/02/2019	09:58	23:39	1h44m41s	11°18'18"	65°22'26"	0.902	1.62164
19/02/2019	09:41	23:36	2h02m41s	13°02'35"	63°02'02"	0.907	1.68175
26/02/2019	09:25	23:34	2h20m53s	14°41'37"	60°42'10"	0.912	1.74144
05/03/2019	09:09	23:32	2h39m19s	16°14'50"	58°22'45"	0.917	1.80059
12/03/2019	08:53	23:30	2h57m59s	17°41'38"	56°04'00"	0.923	1.85895
19/03/2019	08:38	23:28	3h16m52s	19°01'23"	53°46'01"	0.928	1.91631
26/03/2019	08:24	23:25	3h35m58s	20°13'32"	51°28'39"	0.933	1.97259
02/04/2019	08:10	23:22	3h55m17s	21°17'36"	49°11'43"	0.938	2.02768
09/04/2019	07:57	23:19	4h14m47s	22°13'10"	46°55'23"	0.943	2.08135
16/04/2019	07:45	23:15	4h34m27s	22°59'51"	44°39'47"	0.948	2.13341
23/04/2019	07:34	23:10	4h54m14s	23°37'19"	42°24'46"	0.952	2.18377
30/04/2019	07:24	23:05	5h14m06s	24°05'21"	40°10'08"	0.957	2.23236
07/05/2019	07:15	22:59	5h34m02s	24°23'50"	37°55'54"	0.961	2.27900
14/05/2019	07:06	22:52	5h53m57s	24°32'41"	35°42'12"	0.965	2.32349
21/05/2019	06:58	22:44	6h13m50s	24°31'56"	33°28'56"	0.969	2.36577
28/05/2019	06:52	22:35	6h33m37s	24°21'42"	31°15'51"	0.973	2.40579
04/06/2019	06:45	22:25	6h53m16s	24°02'11"	29°02'52"	0.977	2.44341
11/06/2019	06:40	22:14	7h12m46s	23°33'40"	26°50'04"	0.980	2.47846
18/06/2019	06:35	22:03	7h32m02s	22°56'28"	24°37'25"	0.983	2.51087
25/06/2019	06:30	21:50	7h51m05s	22°11'00"	22°24'41"	0.986	2.54064
02/07/2019	06:26	21:37	8h09m53s	21°17'40"	20°11'42"	0.989	2.56765
09/07/2019	06:22	21:22	8h28m26s	20°16'58"	17°58'30"	0.991	2.59174
16/07/2019	06:18	21:08	8h46m42s	19°09'24"	15°45'08"	0.993	2.61288
23/07/2019	06:15	20:52	9h04m42s	17°55'30"	13°31'26"	0.995	2.63107
30/07/2019	06:11	20:36	9h22m27s	16°35'45"	11°17'13"	0.996	2.64623
06/08/2019	06:08	20:19	9h39m58s	15°10'42"	9°02'36"	0.998	2.65824
13/08/2019	06:04	20:02	9h57m14s	13°40'53"	6°47'55"	0.999	2.66706
20/08/2019	06:00	19:45	10h14m18s	12°06'52"	4°33'51"	0.999	2.67273
27/08/2019	05:57	19:27	10h31m12s	10°29'07"	2°23'54"	1.000	2.67522
03/09/2019	05:53	19:09	10h47m57s	8°48'09"	1°05'44"	1.000	2.67441
10/09/2019	05:49	18:51	11h04m34s	7°04'31"	2°43'05"	1.000	2.67030
17/09/2019	05:45	18:33	11h21m06s	5°18'46"	4°57'03"	0.999	2.66295
24/09/2019	05:41	18:14	11h37m35s	3°31'20"	7°16'02"	0.999	2.65239
01/10/2019	05:38	17:56	11h54m04s	1°42'46"	9°37'12"	0.997	2.63854
08/10/2019	05:34	17:38	12h10m33s	-0°06'25"	11°59'44"	0.996	2.62142
15/10/2019	05:30	17:19	12h27m05s	-1°55'38"	14°23'17"	0.994	2.60113
22/10/2019	05:26	17:01	12h43m43s	-3°44'25"	16°47'50"	0.992	2.57777
29/10/2019	05:23	16:43	13h00m29s	-5°32'12"	19°13'21"	0.990	2.55130
05/11/2019	05:19	16:25	13h17m25s	-7°18'24"	21°39'37"	0.987	2.52177
12/11/2019	05:16	16:08	13h34m32s	-9°02'24"	24°06'21"	0.984	2.48936
19/11/2019	05:13	15:50	13h51m53s	-10°43'38"	26°33'29"	0.981	2.45421
26/11/2019	05:10	15:33	14h09m30s	-12°21'31"	29°01'02"	0.978	2.41634
03/12/2019	05:07	15:17	14h27m23s	-13°55'21"	31°28'46"	0.974	2.37586
10/12/2019	05:04	15:01	14h45m35s	-15°24'28"	33°56'19"	0.970	2.33299
17/12/2019	05:01	14:46	15h04m06s	-16°48'15"	36°23'32"	0.966	2.28791
24/12/2019	04:59	14:31	15h22m57s	-18°06'03"	38°50'21"	0.961	2.24074
31/12/2019	04:56	14:17	15h42m09s	-19°17'10"	41°16'38"	0.957	2.19160

Jupiter

Date	Rise	Set	RA	Dec	Elongation	Ill Fr	DIST(AU)
01/01/2019	06:01	15:00	16h41m23s	-21°34'20"	28°29'27"	0.998	6.19341
08/01/2019	05:40	14:37	16h47m34s	-21°45'43"	34°10'39"	0.997	6.13267
15/01/2019	05:20	14:15	16h53m34s	-21°55'50"	39°54'35"	0.997	6.06279
22/01/2019	04:58	13:52	16h59m20s	-22°04'42"	45°41'25"	0.996	5.98445
29/01/2019	04:37	13:30	17h04m49s	-22°12'23"	51°31'40"	0.995	5.89834
05/02/2019	04:15	13:07	17h10m00s	-22°18'56"	57°25'51"	0.994	5.80514
12/02/2019	03:53	12:44	17h14m50s	-22°24'25"	63°24'13"	0.993	5.70578
19/02/2019	03:30	12:20	17h19m15s	-22°28'55"	69°26'59"	0.992	5.60131
26/02/2019	03:07	11:56	17h23m14s	-22°32'32"	75°34'40"	0.992	5.49279
05/03/2019	02:43	11:32	17h26m43s	-22°35'22"	81°47'59"	0.991	5.38127
12/03/2019	02:19	11:07	17h29m40s	-22°37'30"	88°07'18"	0.991	5.26805
19/03/2019	01:54	10:42	17h32m03s	-22°39'03"	94°32'47"	0.991	5.15451
26/03/2019	01:28	10:16	17h33m50s	-22°40'05"	101°04'54"	0.991	5.04203
02/04/2019	01:02	09:49	17h35m00s	-22°40'42"	107°44'17"	0.992	4.93197
09/04/2019	00:35	09:22	17h35m29s	-22°40'55"	114°31'14"	0.993	4.82586
16/04/2019	00:07	08:55	17h35m19s	-22°40'48"	121°25'34"	0.993	4.72531
23/04/2019	23:35	08:26	17h34m29s	-22°40'20"	128°27'16"	0.994	4.63180
30/04/2019	23:05	07:57	17h33m01s	-22°39'31"	135°36'25"	0.996	4.54674
07/05/2019	22:36	07:28	17h30m56s	-22°38'19"	142°52'39"	0.997	4.47160
14/05/2019	22:05	06:58	17h28m19s	-22°36'43"	150°14'58"	0.998	4.40776
21/05/2019	21:34	06:27	17h25m14s	-22°34'41"	157°42'14"	0.999	4.35632
28/05/2019	21:03	05:57	17h21m47s	-22°32'13"	165°13'29"	0.999	4.31814
04/06/2019	20:32	05:26	17h18m04s	-22°29'20"	172°47'04"	1.000	4.29400
11/06/2019	20:00	04:55	17h14m14s	-22°26'07"	179°17'47"	1.000	4.28436
18/06/2019	19:29	04:23	17h10m24s	-22°22'41"	172°00'36"	1.000	4.28929
25/06/2019	18:57	03:53	17h06m42s	-22°19'10"	164°29'07"	0.999	4.30852
02/07/2019	18:26	03:22	17h03m15s	-22°15'47"	157°00'50"	0.999	4.34167
09/07/2019	17:55	02:52	17h00m11s	-22°12'43"	149°37'39"	0.998	4.38801
16/07/2019	17:25	02:22	16h57m34s	-22°10'11"	142°21'02"	0.997	4.44649
23/07/2019	16:55	01:52	16h55m30s	-22°08'22"	135°11'38"	0.995	4.51590
30/07/2019	16:26	01:23	16h54m01s	-22°07'24"	128°09'50"	0.994	4.59502
06/08/2019	15:58	00:55	16h53m10s	-22°07'23"	121°16'07"	0.993	4.68247
13/08/2019	15:30	00:27	16h52m57s	-22°08'24"	114°30'51"	0.992	4.77670
20/08/2019	15:03	23:56	16h53m24s	-22°10'25"	107°53'47"	0.992	4.87624
27/08/2019	14:37	23:29	16h54m29s	-22°13'25"	101°24'24"	0.991	4.97970
03/09/2019	14:12	23:03	16h56m12s	-22°17'18"	95°02'22"	0.991	5.08567
10/09/2019	13:47	22:38	16h58m30s	-22°21'57"	88°47'28"	0.991	5.19270
17/09/2019	13:23	22:13	17h01m23s	-22°27'14"	82°39'07"	0.991	5.29945
24/09/2019	12:59	21:48	17h04m48s	-22°32'58"	76°36'29"	0.991	5.40477
01/10/2019	12:36	21:24	17h08m42s	-22°39'00"	70°38'58"	0.992	5.50750
08/10/2019	12:14	21:00	17h13m05s	-22°45'08"	64°46'14"	0.993	5.60643
15/10/2019	11:51	20:37	17h17m53s	-22°51'12"	58°57'48"	0.993	5.70056
22/10/2019	11:30	20:14	17h23m04s	-22°57'01"	53°12'52"	0.994	5.78903
29/10/2019	11:08	19:52	17h28m36s	-23°02'24"	47°30'52"	0.995	5.87097
05/11/2019	10:47	19:30	17h34m27s	-23°07'13"	41°51'32"	0.996	5.94552
12/11/2019	10:26	19:08	17h40m34s	-23°11'19"	36°14'33"	0.997	6.01197
19/11/2019	10:05	18:47	17h46m56s	-23°14'33"	30°39'21"	0.998	6.06981
26/11/2019	09:44	18:26	17h53m29s	-23°16'50"	25°05'25"	0.998	6.11848
03/12/2019	09:23	18:05	18h00m13s	-23°18'03"	19°32'34"	0.999	6.15744
10/12/2019	09:03	17:44	18h07m04s	-23°18'10"	14°00'40"	0.999	6.18635
17/12/2019	08:42	17:23	18h14m00s	-23°17'06"	8°29'20"	1.000	6.20501
24/12/2019	08:21	17:03	18h21m00s	-23°14'50"	2°58'09"	1.000	6.21323
31/12/2019	08:00	16:43	18h28m01s	-23°11'24"	2°33'23"	1.000	6.21082

Saturn

Date	Rise	Set	RA	Dec	Elongation	Ill Fr	DIST(AU)
01/01/2019	08:12	17:02	18h49m02s	-22°28'01"	1°10'02"	1.000	11.06185
08/01/2019	07:48	16:39	18h52m36s	-22°24'10"	5°16'18"	1.000	11.05723
15/01/2019	07:24	16:15	18h56m08s	-22°20'01"	11°34'22"	1.000	11.03978
22/01/2019	06:59	15:51	18h59m37s	-22°15'36"	17°53'09"	1.000	11.00978
29/01/2019	06:35	15:28	19h03m01s	-22°11'01"	24°12'38"	1.000	10.96761
05/02/2019	06:10	15:04	19h06m19s	-22°06'18"	30°33'07"	0.999	10.91365
12/02/2019	05:45	14:40	19h09m27s	-22°01'32"	36°54'35"	0.999	10.84853
19/02/2019	05:20	14:16	19h12m26s	-21°56'47"	43°17'02"	0.999	10.77310
26/02/2019	04:55	13:51	19h15m14s	-21°52'10"	49°40'51"	0.999	10.68827
05/03/2019	04:30	13:27	19h17m48s	-21°47'45"	56°06'27"	0.998	10.59498
12/03/2019	04:04	13:02	19h20m08s	-21°43'37"	62°33'58"	0.998	10.49434
19/03/2019	03:39	12:37	19h22m13s	-21°39'52"	69°03'24"	0.998	10.38769
26/03/2019	03:13	12:11	19h24m00s	-21°36'34"	75°35'03"	0.998	10.27637
02/04/2019	02:46	11:45	19h25m30s	-21°33'48"	82°09'24"	0.998	10.16170
09/04/2019	02:20	11:19	19h26m40s	-21°31'38"	88°46'39"	0.998	10.04516
16/04/2019	01:53	10:52	19h27m31s	-21°30'08"	95°26'43"	0.998	9.92840
23/04/2019	01:26	10:25	19h28m02s	-21°29'20"	102°09'44"	0.998	9.81298
30/04/2019	00:59	09:58	19h28m13s	-21°29'15"	108°56'07"	0.998	9.70041
07/05/2019	00:31	09:30	19h28m03s	-21°29'54"	115°46'00"	0.998	9.59229
14/05/2019	00:03	09:02	19h27m33s	-21°31'17"	122°39'07"	0.998	9.49029
21/05/2019	23:31	08:34	19h26m44s	-21°33'20"	129°35'18"	0.998	9.39590
28/05/2019	23:02	08:05	19h25m37s	-21°36'01"	136°34'41"	0.999	9.31048
04/06/2019	22:34	07:36	19h24m14s	-21°39'16"	143°37'11"	0.999	9.23538
11/06/2019	22:05	07:06	19h22m35s	-21°42'59"	150°42'17"	0.999	9.17189
18/06/2019	21:36	06:36	19h20m45s	-21°47'04"	157°49'23"	1.000	9.12100
25/06/2019	21:07	06:07	19h18m45s	-21°51'25"	164°58'15"	1.000	9.08346
02/07/2019	20:37	05:37	19h16m38s	-21°55'55"	172°08'30"	1.000	9.05995
09/07/2019	20:08	05:06	19h14m27s	-22°00'27"	179°15'41"	1.000	9.05095
16/07/2019	19:39	04:36	19h12m15s	-22°04'55"	173°28'16"	1.000	9.05654
23/07/2019	19:09	04:06	19h10m07s	-22°09'13"	166°17'51"	1.000	9.07656
30/07/2019	18:40	03:37	19h08m04s	-22°13'16"	159°08'01"	1.000	9.11072
06/08/2019	18:11	03:07	19h06m11s	-22°17'01"	151°59'34"	0.999	9.15852
13/08/2019	17:42	02:37	19h04m29s	-22°20'23"	144°53'16"	0.999	9.21909
20/08/2019	17:14	02:08	19h03m02s	-22°23'20"	137°49'27"	0.999	9.29137
27/08/2019	16:45	01:39	19h01m51s	-22°25'50"	130°48'10"	0.999	9.37426
03/09/2019	16:17	01:11	19h00m58s	-22°27'52"	123°49'43"	0.998	9.46651
10/09/2019	15:49	00:42	19h00m24s	-22°29'24"	116°54'32"	0.998	9.56660
17/09/2019	15:21	00:15	19h00m11s	-22°30'27"	110°02'45"	0.998	9.67298
24/09/2019	14:54	23:43	19h00m18s	-22°31'00"	103°14'04"	0.998	9.78415
01/10/2019	14:27	23:16	19h00m46s	-22°31'02"	96°28'26"	0.998	9.89854
08/10/2019	14:00	22:50	19h01m34s	-22°30'32"	89°46'02"	0.998	10.01447
15/10/2019	13:34	22:23	19h02m43s	-22°29'31"	83°06'47"	0.998	10.13029
22/10/2019	13:08	21:57	19h04m10s	-22°27'57"	76°30'19"	0.998	10.24453
29/10/2019	12:42	21:32	19h05m56s	-22°25'50"	69°56'17"	0.998	10.35571
05/11/2019	12:16	21:07	19h08m00s	-22°23'10"	63°24'43"	0.998	10.46231
12/11/2019	11:51	20:42	19h10m19s	-22°19'57"	56°55'35"	0.998	10.56294
19/11/2019	11:25	20:17	19h12m53s	-22°16'10"	50°28'26"	0.999	10.65643
26/11/2019	11:00	19:53	19h15m39s	-22°11'49"	44°02'55"	0.999	10.74166
03/12/2019	10:35	19:29	19h18m37s	-22°06'55"	37°38'58"	0.999	10.81749
10/12/2019	10:10	19:05	19h21m45s	-22°01'28"	31°16'34"	0.999	10.88299
17/12/2019	09:46	18:41	19h25m01s	-21°55'31"	24°55'26"	1.000	10.93747
24/12/2019	09:21	18:17	19h28m23s	-21°49'05"	18°35'09"	1.000	10.98031
31/12/2019	08:56	17:54	19h31m50s	-21°42'12"	12°15'36"	1.000	11.01091

Uranus

Date	Rise	Set	RA	Dec	Elongation	Ill Fr	DIST(AU)
01/01/2019	12:49	02:23	1h47m08s	10°28'49"	108°20'55"	0.999	19.53242
08/01/2019	12:21	01:56	1h47m04s	10°28'44"	101°11'52"	0.999	19.64869
15/01/2019	11:54	01:28	1h47m10s	10°29'34"	94°05'36"	0.999	19.76784
22/01/2019	11:27	01:01	1h47m26s	10°31'18"	87°02'25"	0.999	19.88797
29/01/2019	10:59	00:34	1h47m51s	10°33'55"	80°02'14"	0.999	20.00736
05/02/2019	10:32	00:07	1h48m26s	10°37'24"	73°05'03"	0.999	20.12431
12/02/2019	10:05	23:37	1h49m10s	10°41'40"	66°11'08"	0.999	20.23705
19/02/2019	09:38	23:11	1h50m01s	10°46'43"	59°20'42"	1.000	20.34397
26/02/2019	09:11	22:45	1h51m01s	10°52'25"	52°33'32"	1.000	20.44370
05/03/2019	08:44	22:19	1h52m08s	10°58'45"	45°49'23"	1.000	20.53495
12/03/2019	08:17	21:53	1h53m20s	11°05'37"	39°08'18"	1.000	20.61646
19/03/2019	07:51	21:27	1h54m39s	11°12'56"	32°30'23"	1.000	20.68718
26/03/2019	07:24	21:02	1h56m01s	11°20'38"	25°55'21"	1.000	20.74636
02/04/2019	06:57	20:36	1h57m28s	11°28'36"	19°22'48"	1.000	20.79333
09/04/2019	06:31	20:11	1h58m57s	11°36'47"	12°52'37"	1.000	20.82747
16/04/2019	06:04	19:45	2h00m29s	11°45'04"	6°25'04"	1.000	20.84843
23/04/2019	05:38	19:20	2h02m01s	11°53'23"	0°29'21"	1.000	20.85611
30/04/2019	05:11	18:55	2h03m34s	12°01'40"	6°28'00"	1.000	20.85049
07/05/2019	04:44	18:29	2h05m05s	12°09'49"	12°51'06"	1.000	20.83161
14/05/2019	04:18	18:04	2h06m35s	12°17'45"	19°13'33"	1.000	20.79977
21/05/2019	03:51	17:38	2h08m03s	12°25'24"	25°35'23"	1.000	20.75547
28/05/2019	03:24	17:13	2h09m27s	12°32'43"	31°57'06"	1.000	20.69929
04/06/2019	02:58	16:47	2h10m47s	12°39'37"	38°19'11"	1.000	20.63185
11/06/2019	02:31	16:21	2h12m02s	12°46'03"	44°41'44"	1.000	20.55399
18/06/2019	02:04	15:55	2h13m12s	12°51'56"	51°04'59"	1.000	20.46676
25/06/2019	01:37	15:29	2h14m15s	12°57'14"	57°29'28"	1.000	20.37122
02/07/2019	01:10	15:03	2h15m10s	13°01'53"	63°55'42"	0.999	20.26845
09/07/2019	00:43	14:36	2h15m59s	13°05'52"	70°23'52"	0.999	20.15976
16/07/2019	00:16	14:10	2h16m38s	13°09'08"	76°54'04"	0.999	20.04661
23/07/2019	23:45	13:43	2h17m10s	13°11'40"	83°26'42"	0.999	19.93042
30/07/2019	23:18	13:16	2h17m32s	13°13'25"	90°02'19"	0.999	19.81262
06/08/2019	22:51	12:48	2h17m45s	13°14'23"	96°41'01"	0.999	19.69479
13/08/2019	22:23	12:21	2h17m49s	13°14'33"	103°22'46"	0.999	19.57864
20/08/2019	21:55	11:53	2h17m43s	13°13'56"	110°07'46"	0.999	19.46574
27/08/2019	21:28	11:25	2h17m28s	13°12'32"	116°56'24"	0.999	19.35763
03/09/2019	21:00	10:57	2h17m04s	13°10'24"	123°48'43"	1.000	19.25593
10/09/2019	20:32	10:29	2h16m32s	13°07'33"	130°44'26"	1.000	19.16226
17/09/2019	20:04	10:01	2h15m51s	13°04'02"	137°43'29"	1.000	19.07804
24/09/2019	19:36	09:32	2h15m04s	12°59'55"	144°45'59"	1.000	19.00453
01/10/2019	19:08	09:03	2h14m10s	12°55'17"	151°51'52"	1.000	18.94301
08/10/2019	18:40	08:34	2h13m12s	12°50'14"	159°00'36"	1.000	18.89459
15/10/2019	18:12	08:05	2h12m09s	12°44'50"	166°11'43"	1.000	18.86006
22/10/2019	17:44	07:36	2h11m04s	12°39'13"	173°24'47"	1.000	18.84002
29/10/2019	17:15	07:07	2h09m57s	12°33'29"	179°07'53"	1.000	18.83492
05/11/2019	16:47	06:38	2h08m51s	12°27'47"	171°59'44"	1.000	18.84499
12/11/2019	16:19	06:09	2h07m46s	12°22'13"	164°41'57"	1.000	18.87006
19/11/2019	15:51	05:40	2h06m44s	12°16'55"	157°23'14"	1.000	18.90971
26/11/2019	15:23	05:12	2h05m47s	12°12'00"	150°04'05"	1.000	18.96341
03/12/2019	14:55	04:43	2h04m55s	12°07'34"	142°45'11"	1.000	19.03033
10/12/2019	14:27	04:14	2h04m09s	12°03'44"	135°27'15"	1.000	19.10931
17/12/2019	13:59	03:46	2h03m31s	12°00'35"	128°10'36"	1.000	19.19902
24/12/2019	13:31	03:18	2h03m02s	11°58'11"	120°55'23"	1.000	19.29809
31/12/2019	13:03	02:50	2h02m41s	11°56'36"	113°42'05"	0.999	19.40493

Neptune

Date	Rise	Set	RA	Dec	Elongation	Ill Fr	DIST(AU)
01/01/2019	11:17	22:24	23h02m52s	-7°09'19"	63°50'01"	1.000	30.35959
08/01/2019	10:50	21:57	23h03m27s	-7°05'36"	56°51'13"	1.000	30.46522
15/01/2019	10:23	21:30	23h04m06s	-7°01'22"	49°53'58"	1.000	30.56286
22/01/2019	09:55	21:04	23h04m50s	-6°56'40"	42°58'30"	1.000	30.65114
29/01/2019	09:28	20:38	23h05m38s	-6°51'35"	36°04'38"	1.000	30.72891
05/02/2019	09:01	20:11	23h06m30s	-6°46'09"	29°12'19"	1.000	30.79511
12/02/2019	08:34	19:45	23h07m24s	-6°40'27"	22°21'48"	1.000	30.84876
19/02/2019	08:07	19:19	23h08m21s	-6°34'32"	15°33'25"	1.000	30.88920
26/02/2019	07:40	18:53	23h09m19s	-6°28'28"	8°47'34"	1.000	30.91603
05/03/2019	07:13	18:27	23h10m18s	-6°22'20"	2°11'54"	1.000	30.92891
12/03/2019	06:46	18:01	23h11m17s	-6°16'12"	4°51'31"	1.000	30.92767
19/03/2019	06:20	17:34	23h12m16s	-6°10'08"	11°30'52"	1.000	30.91242
26/03/2019	05:53	17:08	23h13m14s	-6°04'12"	18°11'16"	1.000	30.88354
02/04/2019	05:26	16:42	23h14m10s	-5°58'28"	24°51'07"	1.000	30.84143
09/04/2019	04:59	16:16	23h15m03s	-5°52'59"	31°30'13"	1.000	30.78665
16/04/2019	04:32	15:49	23h15m54s	-5°47'50"	38°08'23"	1.000	30.72003
23/04/2019	04:04	15:23	23h16m42s	-5°43'04"	44°45'48"	1.000	30.64260
30/04/2019	03:37	14:56	23h17m25s	-5°38'43"	51°22'52"	1.000	30.55537
07/05/2019	03:10	14:30	23h18m04s	-5°34'51"	57°59'50"	1.000	30.45946
14/05/2019	02:43	14:03	23h18m39s	-5°31'30"	64°36'40"	1.000	30.35623
21/05/2019	02:16	13:36	23h19m08s	-5°28'43"	71°13'28"	1.000	30.24716
28/05/2019	01:49	13:09	23h19m32s	-5°26'30"	77°50'42"	1.000	30.13364
04/06/2019	01:21	12:42	23h19m50s	-5°24'54"	84°28'41"	1.000	30.01715
11/06/2019	00:54	12:15	23h20m02s	-5°23'55"	91°07'25"	1.000	29.89934
18/06/2019	00:26	11:47	23h20m09s	-5°23'34"	97°46'54"	1.000	29.78186
25/06/2019	23:55	11:20	23h20m09s	-5°23'50"	104°27'32"	1.000	29.66626
02/07/2019	23:27	10:52	23h20m04s	-5°24'43"	111°09'40"	1.000	29.55409
09/07/2019	23:00	10:24	23h19m53s	-5°26'11"	117°53'15"	1.000	29.44698
16/07/2019	22:32	09:57	23h19m36s	-5°28'14"	124°38'11"	1.000	29.34652
23/07/2019	22:04	09:28	23h19m15s	-5°30'49"	131°24'42"	1.000	29.25406
30/07/2019	21:37	09:00	23h18m48s	-5°33'52"	138°13'07"	1.000	29.17091
06/08/2019	21:09	08:32	23h18m18s	-5°37'22"	145°03'21"	1.000	29.09840
13/08/2019	20:41	08:04	23h17m43s	-5°41'13"	151°55'07"	1.000	29.03767
20/08/2019	20:13	07:35	23h17m06s	-5°45'22"	158°48'23"	1.000	28.98957
27/08/2019	19:45	07:07	23h16m26s	-5°49'44"	165°43'11"	1.000	28.95486
03/09/2019	19:17	06:38	23h15m44s	-5°54'15"	172°38'20"	1.000	28.93422
10/09/2019	18:49	06:10	23h15m02s	-5°58'50"	178°53'55"	1.000	28.92804
17/09/2019	18:22	05:41	23h14m19s	-6°03'22"	173°13'08"	1.000	28.93641
24/09/2019	17:54	05:13	23h13m37s	-6°07'48"	166°14'05"	1.000	28.95927
01/10/2019	17:26	04:44	23h12m57s	-6°12'03"	159°11'59"	1.000	28.99642
08/10/2019	16:58	04:16	23h12m18s	-6°16'00"	152°08'31"	1.000	29.04739
15/10/2019	16:30	03:47	23h11m43s	-6°19'36"	145°04'15"	1.000	29.11134
22/10/2019	16:02	03:19	23h11m12s	-6°22'47"	137°59'13"	1.000	29.18737
29/10/2019	15:34	02:51	23h10m45s	-6°25'29"	130°53'30"	1.000	29.27444
05/11/2019	15:07	02:23	23h10m23s	-6°27'38"	123°47'33"	1.000	29.37125
12/11/2019	14:39	01:55	23h10m06s	-6°29'12"	116°41'45"	1.000	29.47624
19/11/2019	14:11	01:27	23h09m55s	-6°30'09"	109°36'08"	1.000	29.58785
26/11/2019	13:44	01:00	23h09m51s	-6°30'28"	102°30'41"	1.000	29.70448
03/12/2019	13:16	00:32	23h09m52s	-6°30'06"	95°25'45"	1.000	29.82434
10/12/2019	12:49	00:05	23h10m00s	-6°29'05"	88°21'47"	1.000	29.94555
17/12/2019	12:21	23:34	23h10m14s	-6°27'25"	81°18'48"	1.000	30.06631
24/12/2019	11:54	23:07	23h10m34s	-6°25'07"	74°16'45"	1.000	30.18492
31/12/2019	11:27	22:40	23h11m00s	-6°22'12"	67°15'50"	1.000	30.29957

Pluto

Date	Rise	Set	RA	Dec	Elongation	Ill Fr	DIST(AU)
01/01/2019	08:50	17:45	19h29m09s	-21°57'34"	10°20'15"	1.000	34.67919
08/01/2019	08:23	17:18	19h30m09s	-21°56'03"	3°26'14"	1.000	34.69838
15/01/2019	07:56	16:52	19h31m10s	-21°54'31"	3°27'51"	1.000	34.70314
22/01/2019	07:30	16:26	19h32m11s	-21°52'57"	10°21'10"	1.000	34.69356
29/01/2019	07:03	15:59	19h33m10s	-21°51'25"	17°14'18"	1.000	34.66989
05/02/2019	06:36	15:33	19h34m08s	-21°49'56"	24°07'17"	1.000	34.63247
12/02/2019	06:10	15:06	19h35m03s	-21°48'32"	30°59'54"	1.000	34.58188
19/02/2019	05:43	14:40	19h35m56s	-21°47'13"	37°51'57"	1.000	34.51903
26/02/2019	05:16	14:13	19h36m44s	-21°46'03"	44°43'34"	1.000	34.44492
05/03/2019	04:49	13:46	19h37m29s	-21°45'01"	51°34'59"	1.000	34.36060
12/03/2019	04:22	13:19	19h38m08s	-21°44'10"	58°26'04"	1.000	34.26734
19/03/2019	03:55	12:53	19h38m43s	-21°43'31"	65°16'37"	1.000	34.16664
26/03/2019	03:28	12:26	19h39m12s	-21°43'05"	72°06'43"	1.000	34.06002
02/04/2019	03:01	11:58	19h39m35s	-21°42'52"	78°56'42"	1.000	33.94898
09/04/2019	02:34	11:31	19h39m53s	-21°42'54"	85°46'32"	1.000	33.83516
16/04/2019	02:07	11:04	19h40m04s	-21°43'10"	92°36'01"	1.000	33.72034
23/04/2019	01:39	10:36	19h40m09s	-21°43'41"	99°25'12"	1.000	33.60621
30/04/2019	01:12	10:09	19h40m08s	-21°44'27"	106°14'24"	1.000	33.49437
07/05/2019	00:44	09:41	19h40m01s	-21°45'28"	113°03'43"	1.000	33.38648
14/05/2019	00:16	09:13	19h39m48s	-21°46'42"	119°52'56"	1.000	33.28422
21/05/2019	23:45	08:45	19h39m30s	-21°48'09"	126°42'00"	1.000	33.18909
28/05/2019	23:17	08:17	19h39m06s	-21°49'48"	133°31'14"	1.000	33.10242
04/06/2019	22:49	07:49	19h38m38s	-21°51'38"	140°20'48"	1.000	33.02552
11/06/2019	22:21	07:21	19h38m06s	-21°53'37"	147°10'28"	1.000	32.95966
18/06/2019	21:53	06:52	19h37m30s	-21°55'43"	154°00'07"	1.000	32.90581
25/06/2019	21:25	06:24	19h36m51s	-21°57'55"	160°49'57"	1.000	32.86472
02/07/2019	20:57	05:56	19h36m11s	-22°00'10"	167°40'07"	1.000	32.83708
09/07/2019	20:29	05:27	19h35m28s	-22°02'29"	174°30'10"	1.000	32.82345
16/07/2019	20:01	04:59	19h34m45s	-22°04'46"	178°34'26"	1.000	32.82407
23/07/2019	19:33	04:30	19h34m03s	-22°07'03"	171°46'49"	1.000	32.83891
30/07/2019	19:05	04:02	19h33m21s	-22°09'16"	164°55'54"	1.000	32.86789
06/08/2019	18:37	03:34	19h32m40s	-22°11'24"	158°04'29"	1.000	32.91076
13/08/2019	18:09	03:05	19h32m02s	-22°13'25"	151°12'58"	1.000	32.96692
20/08/2019	17:41	02:37	19h31m28s	-22°15'18"	144°21'20"	1.000	33.03557
27/08/2019	17:13	02:09	19h30m57s	-22°17'01"	137°29'19"	1.000	33.11586
03/09/2019	16:46	01:41	19h30m30s	-22°18'35"	130°36'57"	1.000	33.20680
10/09/2019	16:18	01:13	19h30m08s	-22°19'56"	123°44'31"	1.000	33.30707
17/09/2019	15:50	00:45	19h29m52s	-22°21'06"	116°52'01"	1.000	33.41526
24/09/2019	15:23	00:17	19h29m41s	-22°22'02"	109°59'11"	1.000	33.52995
01/10/2019	14:55	23:46	19h29m36s	-22°22'45"	103°05'59"	1.000	33.64961
08/10/2019	14:28	23:18	19h29m38s	-22°23'15"	96°12'39"	1.000	33.77253
15/10/2019	14:00	22:51	19h29m45s	-22°23'31"	89°19'18"	1.000	33.89694
22/10/2019	13:33	22:23	19h29m59s	-22°23'34"	82°25'41"	1.000	34.02120
29/10/2019	13:06	21:56	19h30m19s	-22°23'23"	75°31'41"	1.000	34.14362
05/11/2019	12:39	21:29	19h30m45s	-22°22'59"	68°37'32"	1.000	34.26243
12/11/2019	12:12	21:02	19h31m17s	-22°22'22"	61°43'24"	1.000	34.37593
19/11/2019	11:45	20:35	19h31m54s	-22°21'34"	54°49'09"	1.000	34.48262
26/11/2019	11:18	20:09	19h32m36s	-22°20'35"	47°54'37"	1.000	34.58107
03/12/2019	10:51	19:42	19h33m22s	-22°19'25"	40°59'59"	1.000	34.66982
10/12/2019	10:24	19:15	19h34m13s	-22°18'07"	34°05'31"	1.000	34.74763
17/12/2019	09:57	18:49	19h35m06s	-22°16'41"	27°11'12"	1.000	34.81353
24/12/2019	09:31	18:22	19h36m03s	-22°15'08"	20°16'50"	1.000	34.86665
31/12/2019	09:04	17:56	19h37m01s	-22°13'30"	13°22'41"	1.000	34.90621

Grange Obs. Latitude: 45°08'32" N Longitude: 7°08'26" E
Local Time = UT + 1.00 hours Elevation: 470 meters

Planet Apsides Report for 2019

Earth

03/01/2019	Perihelion	Distance from Sun:	0.98 AU
05/07/2019	Aphelion	Distance from Sun:	1.02 AU

Mercury

25/02/2019	Perihelion	Distance from Sun:	0.31 AU
24/05/2019	Perihelion	Distance from Sun:	0.31 AU
20/08/2019	Perihelion	Distance from Sun:	0.31 AU
16/11/2019	Perihelion	Distance from Sun:	0.31 AU
12/01/2019	Aphelion	Distance from Sun:	0.47 AU
10/04/2019	Aphelion	Distance from Sun:	0.47 AU
07/07/2019	Aphelion	Distance from Sun:	0.47 AU
03/10/2019	Aphelion	Distance from Sun:	0.47 AU
30/12/2019	Aphelion	Distance from Sun:	0.47 AU

Venus

08/08/2019	Perihelion	Distance from Sun:	0.72 AU
18/04/2019	Aphelion	Distance from Sun:	0.73 AU
28/11/2019	Aphelion	Distance from Sun:	0.73 AU

Mars

26/08/2019	Aphelion	Distance from Sun:	1.67 AU
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Jupiter

No Apsis

Saturn

No Apsis

Grange Obs. Latitude: 45°08'32" N Longitude: 7°08'26" E
Local Time = UT + 1.00 hours Elevation: 470 meters

Planet Conjunction/Opposition Report for 01/01/2019 to 31/12/2019

Mercury

Date	Hour	Event
30/01/2019	3	Superior Conjunction
15/03/2019	3	Inferior Conjunction
22/05/2019	0	Superior Conjunction
22/07/2019	0	Inferior Conjunction
04/09/2019	1	Superior Conjunction
12/11/2019	0	Inferior Conjunction

Venus

Date	Hour	Event
14/08/2019	6	Superior Conjunction

Mars

Date	Hour	Event
02/09/2019	12	Conjunction

Jupiter

Date	Hour	Event
28/12/2019	0	Conjunction (Occultation)
11/06/2019	0	Opposition

Saturn

Date	Hour	Event
02/01/2019	4	Conjunction
10/07/2019	0	Opposition

Uranus

Date	Hour	Event
23/04/2019	0	Conjunction
28/10/2019	9	Opposition

Neptune

Date	Hour	Event
07/03/2019	1	Conjunction
10/09/2019	9	Opposition

Pluto

Date	Hour	Event
11/01/2019	12	Conjunction (Occultation)
15/07/2019	0	Opposition

Planet Data Report

Planet	Mean Dist From Sun (AU)	Period of Revolution	Inclination	Equatorial Diameter (km)
Mercury	0.39	88 days	7°	4880
Venus	0.72	224.7 days	3.4°	12100
Earth	1.00	365.24 days	0°	12756
Mars	1.52	687 days	1.9°	6794
Jupiter	5.20	11.86 years	1.3°	143200
Saturn	9.54	29.46 years	2.5°	120000
Uranus	19.18	84 years	0.8°	52290
Neptune	30.06	165 years	1.8°	50450
Pluto	39.44	248 years	17.2°	2200-2300

Grange Obs. Latitude: 45°08'32" N Longitude: 7°08'26" E
Local Time = UT + 1.00 hours Elevation: 470 meters

Moon Apisdes Report for 01/01/2019 to 31/12/2019

Date	Hour	Apsis	Distance (km)	Diameter
09/01/2019	5	Apogee	406112	0.4904°
21/01/2019	21	Perigee	357353	0.5573°
05/02/2019	10	Apogee	406558	0.4899°
19/02/2019	10	Perigee	356771	0.5582°
04/03/2019	12	Apogee	406393	0.4901°
19/03/2019	21	Perigee	359374	0.5542°
01/04/2019	1	Apogee	405582	0.4910°
16/04/2019	23	Perigee	364207	0.5468°
28/04/2019	19	Apogee	404582	0.4923°
13/05/2019	23	Perigee	369016	0.5397°
26/05/2019	14	Apogee	404136	0.4928°
08/06/2019	0	Perigee	368499	0.5405°
23/06/2019	9	Apogee	404567	0.4923°
05/07/2019	6	Perigee	363730	0.5475°
21/07/2019	1	Apogee	405500	0.4911°
02/08/2019	8	Perigee	359407	0.5541°
17/08/2019	12	Apogee	406230	0.4903°
30/08/2019	17	Perigee	357188	0.5576°
13/09/2019	14	Apogee	406371	0.4901°
28/09/2019	3	Perigee	357820	0.5566°
10/10/2019	20	Apogee	405903	0.4907°
26/10/2019	12	Perigee	361330	0.5512°
07/11/2019	10	Apogee	405047	0.4917°
23/11/2019	9	Perigee	366727	0.5431°
05/12/2019	5	Apogee	404451	0.4924°
18/12/2019	21	Perigee	370269	0.5379°

Grange Obs. Latitude: 45°08'32" N Longitude: 7°08'26" E
Local Time = UT + 1.00 hours Elevation: 470 meters

Moon Nodes Report for 01/01/2019 to 31/12/2019

Date	Time	Node	Illuminated Fraction
07/01/2019	01:07	Descending	0.01
20/01/2019	23:48	Ascending	1.00
03/02/2019	07:34	Descending	0.02
17/02/2019	10:41	Ascending	0.93
02/03/2019	12:02	Descending	0.15
16/03/2019	17:21	Ascending	0.75
29/03/2019	14:07	Descending	0.37
12/04/2019	19:07	Ascending	0.50
25/04/2019	16:01	Descending	0.62
09/05/2019	19:49	Ascending	0.26
22/05/2019	20:11	Descending	0.84
05/06/2019	23:45	Ascending	0.08
19/06/2019	02:48	Descending	0.97
03/07/2019	07:52	Ascending	0.00
16/07/2019	10:04	Descending	1.00
30/07/2019	18:01	Ascending	0.03
12/08/2019	15:44	Descending	0.93
27/08/2019	02:49	Ascending	0.15
08/09/2019	18:34	Descending	0.76
23/09/2019	07:29	Ascending	0.37
05/10/2019	19:48	Descending	0.51
20/10/2019	08:27	Ascending	0.63
01/11/2019	22:39	Descending	0.26
16/11/2019	09:47	Ascending	0.85
29/11/2019	05:12	Descending	0.08
13/12/2019	15:14	Ascending	0.98
26/12/2019	14:00	Descending	0.00

Grange Obs. Latitude: 45°08'32" N Longitude: 7°08'26" E
Local Time = UT + 1.00 hours Elevation: 470 meters

Meteor Showers Report for 01/01/2019 to 31/12/2019

Date	Meteor Shower	ZHR	RA	DEC	Illum. Frac.	Longitude
04/01/2019	Quadrantids	80	15h28m	50°	0.04	283°
12/04/2019	Virginids	5	14h04m	-9°	0.42	22°
23/04/2019	Lyrids	12	18h08m	32°	0.85	32°
29/04/2019	alpha-Scorpiids	5	16h32m	-24°	0.31	38°
06/05/2019	eta-Aquarids	35	22h20m	-1°	0.01	45°
13/05/2019	alpha-Scorpiids	5	16h04m	-24°	0.61	52°
10/06/2019	Ophiuchids	5	17h56m	-23°	0.48	79°
21/06/2019	Ophiuchids	5	17h20m	-20°	0.87	89°
09/07/2019	Capricornids	5			0.45	106°
16/07/2019	Capricornids	5	20h44m	-15°	0.99	113°
21/07/2019	alpha-Cygnids	5	21h00m	48°	0.85	118°
27/07/2019	Capricornids	5	21h00m	-15°	0.30	123°
30/07/2019	delta-Aquarids	20	22h36m	-17°	0.06	126°
01/08/2019	Piscis Australids	5	22h40m	-30°	0.00	128°
03/08/2019	alpha-Capricornids	5	20h36m	-10°	0.06	130°
07/08/2019	iota-Aquarids	8	22h10m	-15°	0.43	134°
13/08/2019	Perseids	75	3h04m	58°	0.94	140°
22/08/2019	alpha-Cygnids	5	21h00m	48°	0.66	148°
09/09/2019	Piscids	10	0h36m	7°	0.78	166°
22/09/2019	Piscids	5	0h24m	0°	0.51	178°
14/10/2019	Piscids	??	1h44m	14°	1.00	200°
23/10/2019	Orionids	25	6h24m	15°	0.33	209°
04/11/2019	Taurids	8	3h44m	14°	0.46	221°
18/11/2019	Leonids	10	10h08m	22°	0.70	235°
10/12/2019	Puppids-Velids	15	9h00m	-48°	0.95	257°
15/12/2019	Geminids	75	7h28m	32°	0.91	262°
23/12/2019	Ursids	5	14h28m	78°	0.12	271°
26/12/2019	Puppids-Velids	15	9h20m	-65°	0.00	274°

Grange Obs. Latitude: 45°08'32" N Longitude: 7°08'26" E
 Local Time = UT + 1.00 hours Elevation: 470 meters

Twilight Report for 01/01/2019 to 31/12/2019

Date	Sun		Astronomical		Nautical		Civil	
	Rise	Set	Begin	End	Begin	End	Begin	End
01/01/2019	08:10	17:00	06:18	18:52	06:54	18:16	07:31	17:39
08/01/2019	08:10	17:07	06:19	18:58	06:54	18:22	07:31	17:46
15/01/2019	08:07	17:15	06:17	19:05	06:52	18:30	07:29	17:53
22/01/2019	08:02	17:24	06:14	19:13	06:49	18:38	07:24	18:02
29/01/2019	07:55	17:34	06:09	19:21	06:43	18:46	07:19	18:11
05/02/2019	07:47	17:44	06:02	19:29	06:36	18:55	07:11	18:20
12/02/2019	07:38	17:54	05:54	19:38	06:28	19:04	07:02	18:30
19/02/2019	07:27	18:04	05:44	19:47	06:18	19:13	06:52	18:39
26/02/2019	07:15	18:14	05:33	19:56	06:07	19:22	06:41	18:48
05/03/2019	07:03	18:24	05:21	20:06	05:55	19:32	06:29	18:58
12/03/2019	06:50	18:33	05:08	20:16	05:42	19:41	06:16	19:07
19/03/2019	06:37	18:42	04:54	20:26	05:29	19:50	06:03	19:16
26/03/2019	06:24	18:51	04:39	20:36	05:15	20:00	05:50	19:25
02/04/2019	06:11	19:00	04:24	20:47	05:01	20:10	05:37	19:35
09/04/2019	05:58	19:09	04:09	20:59	04:47	20:20	05:23	19:44
16/04/2019	05:46	19:18	03:53	21:11	04:33	20:31	05:10	19:54
23/04/2019	05:34	19:27	03:37	21:24	04:19	20:42	04:57	20:03
30/04/2019	05:23	19:36	03:21	21:37	04:05	20:53	04:45	20:13
07/05/2019	05:13	19:44	03:05	21:52	03:53	21:04	04:34	20:23
14/05/2019	05:04	19:53	02:50	22:06	03:41	21:15	04:24	20:32
21/05/2019	04:56	20:01	02:36	22:20	03:31	21:26	04:16	20:41
28/05/2019	04:50	20:08	02:24	22:34	03:22	21:36	04:09	20:49
04/06/2019	04:46	20:14	02:14	22:46	03:16	21:44	04:04	20:56
11/06/2019	04:44	20:18	02:07	22:56	03:12	21:51	04:01	21:01
18/06/2019	04:44	20:22	02:04	23:01	03:11	21:55	04:00	21:05
25/06/2019	04:45	20:23	02:06	23:02	03:12	21:56	04:02	21:06
02/07/2019	04:48	20:22	02:12	22:59	03:16	21:54	04:06	21:05
09/07/2019	04:53	20:20	02:21	22:52	03:23	21:50	04:11	21:02
16/07/2019	04:59	20:15	02:33	22:41	03:31	21:43	04:18	20:57
23/07/2019	05:06	20:09	02:47	22:29	03:41	21:35	04:26	20:50
30/07/2019	05:14	20:01	03:01	22:14	03:51	21:24	04:34	20:41
06/08/2019	05:22	19:52	03:15	21:59	04:02	21:12	04:43	20:31
13/08/2019	05:30	19:42	03:28	21:44	04:13	20:59	04:53	20:19
20/08/2019	05:38	19:31	03:41	21:27	04:23	20:46	05:02	20:07
27/08/2019	05:47	19:19	03:54	21:11	04:34	20:31	05:11	19:54
03/09/2019	05:55	19:06	04:06	20:55	04:44	20:17	05:20	19:41
10/09/2019	06:03	18:53	04:17	20:40	04:54	20:03	05:29	19:27
17/09/2019	06:12	18:39	04:27	20:24	05:03	19:48	05:38	19:14
24/09/2019	06:20	18:26	04:37	20:09	05:12	19:34	05:46	19:00
01/10/2019	06:29	18:13	04:46	19:55	05:21	19:21	05:55	18:47
08/10/2019	06:38	18:00	04:55	19:42	05:30	19:08	06:04	18:34
15/10/2019	06:47	17:47	05:04	19:30	05:38	18:56	06:12	18:22
22/10/2019	06:56	17:35	05:13	19:18	05:47	18:44	06:21	18:10
29/10/2019	07:05	17:24	05:22	19:08	05:56	18:34	06:30	18:00
05/11/2019	07:15	17:14	05:30	18:59	06:04	18:25	06:39	17:50
12/11/2019	07:25	17:06	05:38	18:52	06:13	18:18	06:48	17:43
19/11/2019	07:34	16:59	05:46	18:47	06:21	18:12	06:57	17:36
26/11/2019	07:43	16:54	05:54	18:43	06:29	18:08	07:05	17:32
03/12/2019	07:52	16:50	06:01	18:41	06:36	18:06	07:13	17:29
10/12/2019	07:59	16:49	06:07	18:41	06:42	18:05	07:20	17:28
17/12/2019	08:04	16:50	06:12	18:43	06:48	18:07	07:25	17:30
24/12/2019	08:08	16:53	06:16	18:46	06:51	18:10	07:29	17:33
31/12/2019	08:10	16:59	06:18	18:51	06:54	18:15	07:31	17:38